The DENTAL DIGEST

41 February, 1935 NO. 2

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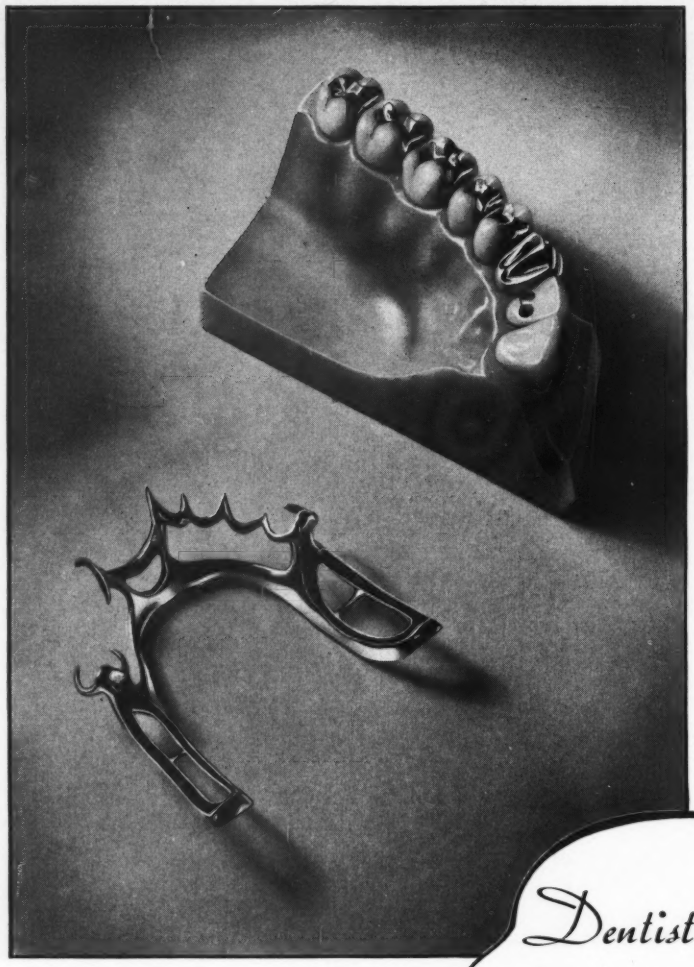

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The DENTAL DIGEST

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THE HEALING OF CYSTS FOLLOWING THE PARTSCH OR OPEN OPERATION

ELLIS GEORGE BOVIK, D.D.S., M.S.D
Chicago

Open Versus Closed Method

DURING the last three and a half years, we have developed at Northwestern University Dental School, a definite technique, using a special obturator, as an aid to the successful healing of cysts following the Partsch or open operation.

It has always been contended by some authorities that the open operation for cysts is not the operation of choice, because they feel that there are certain disadvantages that present themselves. It was as a result of a consideration of these disadvantages that an obturator was constructed to act as a plumper or plug for the cyst cavity following this type of surgery.

Disadvantages of Partsch Method—The disadvantages of the Partsch method according to some operators are:

1. The patient's objection to an open wound in the mouth.
2. The possibility of food packing into the opening, which is disagreeable for the patient, and is also a possible source of infection.
3. The possibility of the wound granulating over and closing before healing has entirely taken place.
4. The possibility of a permanent deformity following the operation.

To anyone who has treated cysts of the jaws using the open method, the disadvantages stated here appear inconsequential. It is not the purpose of this article to convert advocates of the enucleation method to the Partsch or open method, but I shall briefly mention a few of the definite advantages of the open method of cyst surgery as compared with the enucleation or closed method.

Advantages of Partsch Method—1. The Partsch operation is simpler to perform, because it is not necessary to remove the entire cyst sac. In the enucleation method the entire sac must be removed or recurrence must be anticipated. When the cyst sac is entirely enucleated there is necessarily a denuded bony cavity the size of the cyst remaining in the bone which must be filled in by granulation tissue. Actually, therefore, the enucleation method permits infection more than the Partsch method does.

2. Following the Partsch method, healing is by first intention, because all that is necessary to make the operation a success is for the incised edges of the wound to unite. The mucous membrane of the mouth is thus made continuous with the epithelial lining of the cyst cavity. This is accomplished, of course, by means of the sutures. In the enucleation method, healing is necessarily by second intention, because the wound must first be filled with healthy granulation tissue. Naturally it follows that less postoperative care is necessary following the Partsch operation.

3. The Partsch operation is far less radical and fewer teeth are involved. It is seldom necessary to remove any but the actual tooth causing the cyst; whereas in the enucleation method, especially in large cysts, it is often necessary to remove all the teeth in the immediate vicinity, or if not actually to remove them, then to remove the pulp, because of trauma received in peeling out the cyst sac.

Special Obturator

A special type of obturator has been designed which not only overcomes the objections that have been raised to the Partsch operation, but also acts as a stimulating force to hasten bone growth.

Thus the purpose of the obturator is really four-fold: (1) to keep the cyst cavity from granulating over and closing before healing has entirely taken place; (2) to keep the cyst cavity free from food and débris; (3) to prevent any possibility of the tissues "falling in" and causing a deformity; (4) to stimulate and increase new bone growth.

Review of Literature—A review of the literature discloses that similiar appliances have been made in the past to act as drains in many instances, and also to be used in conjunction with the Partsch operation, or modification of it.

In a discussion on the pathology and treatment of cysts, Turner[1] suggests the use of a vulcanite plug to secure drainage following the removal of cysts.

Dod[2] of England reports a dentigerous cyst in the left mandible in the third molar region. The operation was accomplished by means of the enucleation method of operation. The mass of tissue removed contained the crown of the third molar. After three weeks a vulcanite plug was made to fit the cavity; gradually, as healing progressed, the plug was reduced in size. It is apparent that, because this was an enucleation operation, the vulcanite plug acted as a drain and not as an obturator.

Doctor Partsch[3], in his textbook on surgery, describes the open operation for the treatment of cysts of the jaws. He advocates dressing the cyst cavity with iodoform gauze for several days until the mucous membrane of the mouth and the cystic membrane are continuous. This granulation generally takes place in about seven or eight days in larger cysts. He discontinues the packing after this period and instructs the patient to keep the cavity clean by means of the water syringe.

Doctor Partsch states:

I have never found it necessary to use a prosthetic appliance which Brandt and Weiser[4] have proposed as a special protection for the cyst cavity. I have rather found them to be detrimental to the rapid shrinking of the cyst. On the other hand, an opening may be covered with an obturator when the cyst cavity is wide so that a plain secondary nasal sound is produced during speech.

The obturators that we have constructed have all been in moderately large sized cysts. The shape of these appliances is such that it is virtually impossible for them to be detrimental to the healing of the cyst in any man-

[1] Turner, J. G.: Pathology and Treatment of Cysts, Brit. J. Den. Sci. 44:168-179, 1921.
[2] Dod, G. A. N.: Removal of a Dentigerous Cyst, Brit. Den. J. 45:691 (number 21) 1924.
[3] Partsch, Carl: Handb. d. Zahnheilk. 1:300-302.
[4] Footnote 3, p. 303.

ner. The obturator does not depend on the plug to retain itself, but is really kept in position more by the pressure of the cheeks and lips on the button, or outside portion of the appliance. The obturator is reduced in size regularly, so that it exerts only a gentle pressure within the cyst cavity, and therefore acts as a possible stimulus to bone growth.

Methods and Materials

From January 23, 1931, until the present time, nearly fifty patients with large cysts in the jaws were operated on by the Partsch or open operation. Seven of these cases are reported here.

The technique of the Partsch or open operation, and also the position of the postoperative obturator employed may be seen by referring to Fig. 1. This diagram represents a sagittal section of a maxillary cyst occurring in the second bicuspid region. Note that the maxillary sinus

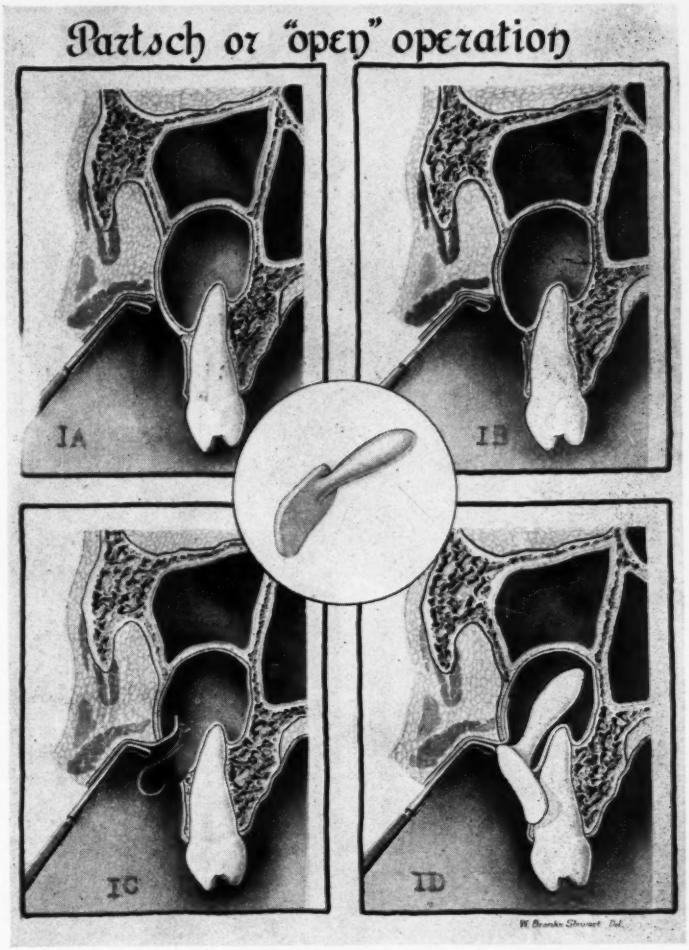


Fig. 1

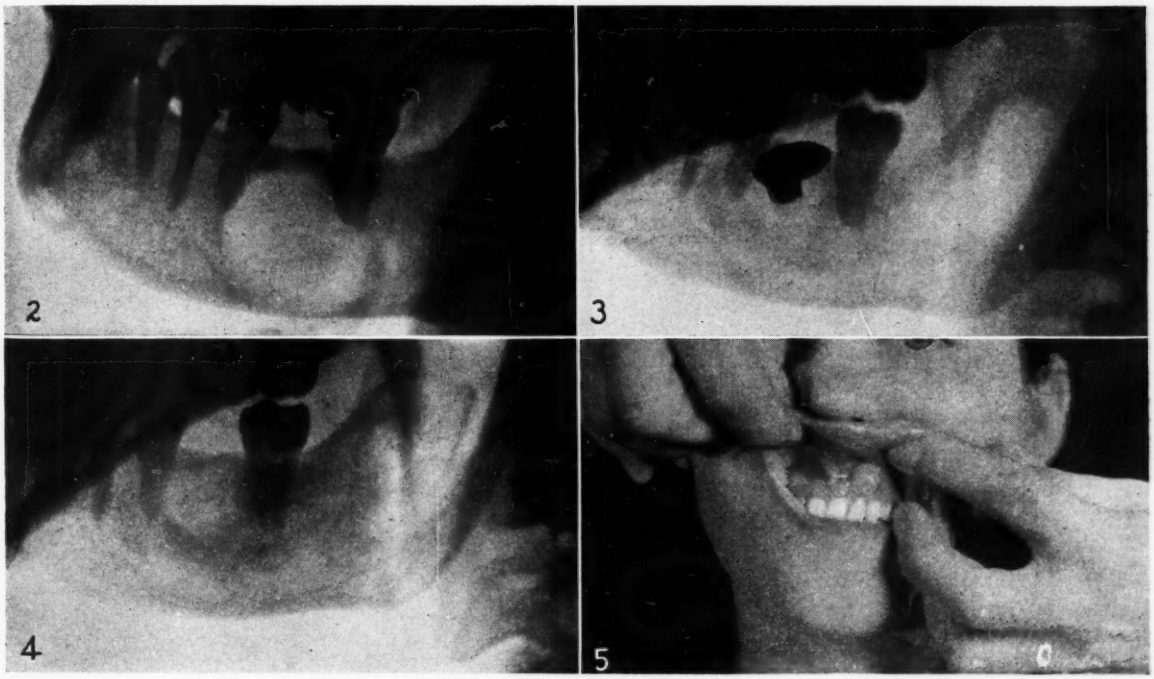
Fig. 1—Technique of Partsch or open operation showing position of postoperative obturator. See text for detailed explanation.

Fig. 2—Case 1—Preoperative roentgenogram taken February 14, 1931.

Fig. 3—Case 1—Postoperative roentgenogram with obturator in place (September 18, 1931).

Fig. 4—Case 1—Postoperative roentgenogram (June 29, 1932).

Fig. 5—Case 2—Obturator used in Case 2 carrying left lateral incisor.



has been shown pushed away by the pressure of the expanding cyst. Fig. 1A shows the semilunar incision made through the mucous membrane exposing the thin bony plate over the cyst cavity. Note that the retractor is shown holding the mucous membrane flap. Fig. 1B shows the thin bony plate removed, exposing the cyst membrane. Often this bony plate is not present at all, but when it is present, its removal is easily accomplished by means of a small sharp chisel or with the bone cutting forceps. Fig. 1C shows the accessible cyst wall removed. This is accomplished either with a pair of fine curved scissors or with a sharp scalpel. Note that the cyst membrane is left intact, except the small section that is removed at the site of the incision. When the contents of the cyst have been evacuated and the accessible wall of the cyst has been removed, the original mucous membrane flap is carried into the cyst cavity and sutured to the cystic membrane remaining as seen in Fig. 1C. When the mucous membrane flap has been sutured to the cyst wall, it is apparent that the cyst cavity is no longer a separate cavity, but is directly continuous with the mucous membrane of the mouth and may be termed a cul-de-sac. After the sutures have been placed, the cavity is carefully packed with a strip of iodoform gauze. This gauze packing is changed every other day until about seven days have elapsed; the sutures are then removed and the impression is taken for the obturator.

Technique for Making Obturator

The technique for making the obturator is extremely simple:

1. A piece of modeling compound tracing stick is softened and tapered into the shape of a cone.

2. The cone of compound is then pushed into the cyst cavity, considerable pressure being exerted with the thumb on the portion of the compound remaining on the outside, so that it is molded close to the gum tissue and forms a flat button.

3. The compound is then chilled and removed.

4. The entire obturator is then dipped in fluid, molten base-plate wax, and quickly removed and allowed to cool. This is done to make the obturator slightly oversize to be sure of an exact, snug fit when placed in the mouth.

5. The modeling compound model is invested in a vulcanizing flask in the usual manner.

6. The flask is then separated, the model removed, and the impression in the flask is wrapped in tin foil, packed, and vulcanized. These obturators have been made with condensites for the sake of esthetics, smoothness, and cleanliness.

7. The obturator is then placed in the patient's mouth in the position shown in Fig. 1D. When the obturator has been inserted, the patient is instructed to remove the appliance at least twice daily and irrigate the cyst cavity thoroughly. The patient returns once a month to have the obturator reduced in size and also to have postoperative roentgenograms made to show the progress of bone regeneration.

Report of Cases

Case 1—Miss B. K. presented for operation on February 20, 1931. The cyst was located in the left mandible in the region of the first molar. The cyst extended from the second bicuspid to the second molar, and from the lower border of the mandible nearly to the occlusal margin of the alveolar crest. Both the second bicuspid and second molar responded to the electric vitality test, but because of the great loss of bone, these teeth were extremely loose.

An open operation was performed without disturbing the teeth. The wound was dressed with iodoform gauze until March 1, 1931. An obturator was constructed and inserted March 5, 1931. The obturator was reduced in size monthly and finally removed altogether on December 2, 1931.

Postoperative roentgenograms (Figs. 3, and 4) were made on September 18, 1931, with the obturator in position, and on June 29, 1932. By comparing these postoperative roentgenograms, bone regeneration can easily be seen. The second bicuspid and second molar are now secure, and a fixed bridge has been constructed.

Case 2—Miss C. D. presented for operation on July 6, 1931. The cyst was in the left maxilla in the region of the left lateral incisor which had been removed by another dentist before the patient came to us. An open operation was done, and none of the teeth was disturbed. Both the left central incisor and the left cuspid responded to the vitality test. It is unfortunate that the original roentgenogram in this case was lost; however, the size of the cyst can be roughly determined by comparing it with the size of a nickel.

Postoperative roentgenograms were made September 22, 1931; considerable healing had taken place. An unusual obturator was constructed for this case, so that the missing lateral incisor could be replaced temporarily.

The obturator was placed July 30, 1931, and reduced in size monthly until January 20, 1932, when it was no longer needed, and the patient was dismissed.

Case 3—Mr. T. K. presented for operation for a cyst on October 21, 1931. This cyst was extensive, involving nearly all the maxilla and hard palate. It evidently had its inception at the upper left lateral incisor. The cyst extended distally to the second molar region on the left side, then across the median line, and extended distally on the right side to the second bicuspid region. The hard palate was distended

Fig. 6—Case 2—Postoperative roentgenogram (September 22, 1931).

Fig. 7—Case 2—Cyst cavity ten days after operation.

Fig. 8—Case 2—Obturator used in Case 2.

Fig. 9—Case 3—Note distention of hard palate before operation.

Fig. 10—Case 3—This picture was taken immediately after operation.

Fig. 11—Case 3—Cyst cavity ten days after operation.

Fig. 12—Case 3—Obturator in place.

Fig. 13—Obturator in Case 3.

Fig. 14—Case 3—Preoperative roentgenogram (October 21, 1931).

Fig. 15—Case 3—Postoperative (April 5, 1932).

Fig. 16—Obturator used in Case 4.

Fig. 17—Case 4—Cyst cavity ten days after operation.

Fig. 18—Case 4—Obturator in place.

Fig. 19—Case 4—Preoperative roentgenogram (October 23, 1931).

Fig. 20—Case 4—Postoperative roentgenogram (February 2, 1932).

Fig. 21—Case 5—Before operation. Note swelling of maxilla.

Fig. 22—Case 5—Appearance of cyst cavity ten days after operation.

Fig. 23—Case 5—Obturator in place.

Fig. 24—Obturator used in Case 5.

Fig. 25—Case 5—Preoperative roentgenogram taken November 2, 1931.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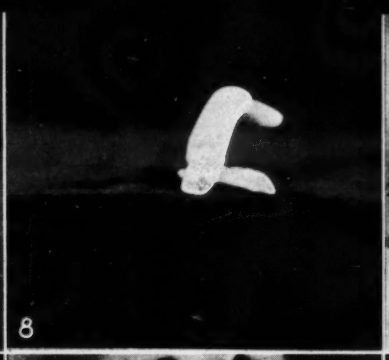
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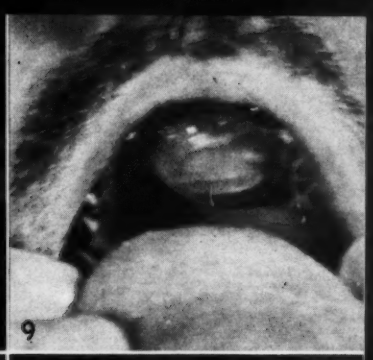
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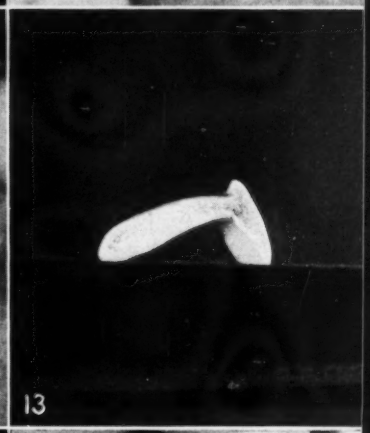
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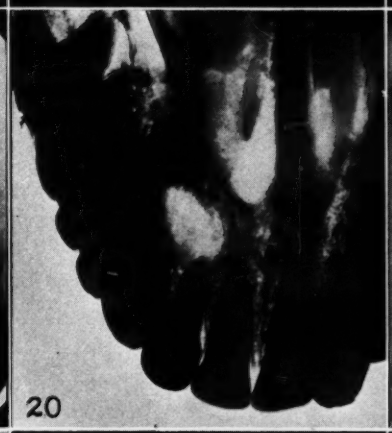
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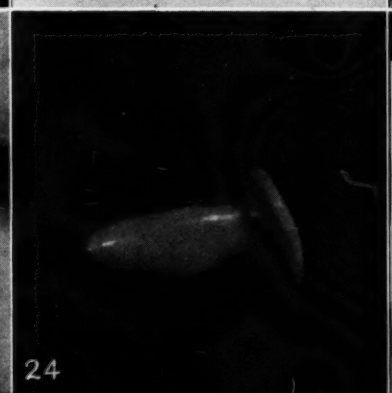
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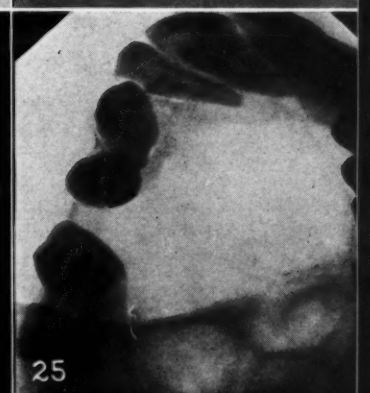
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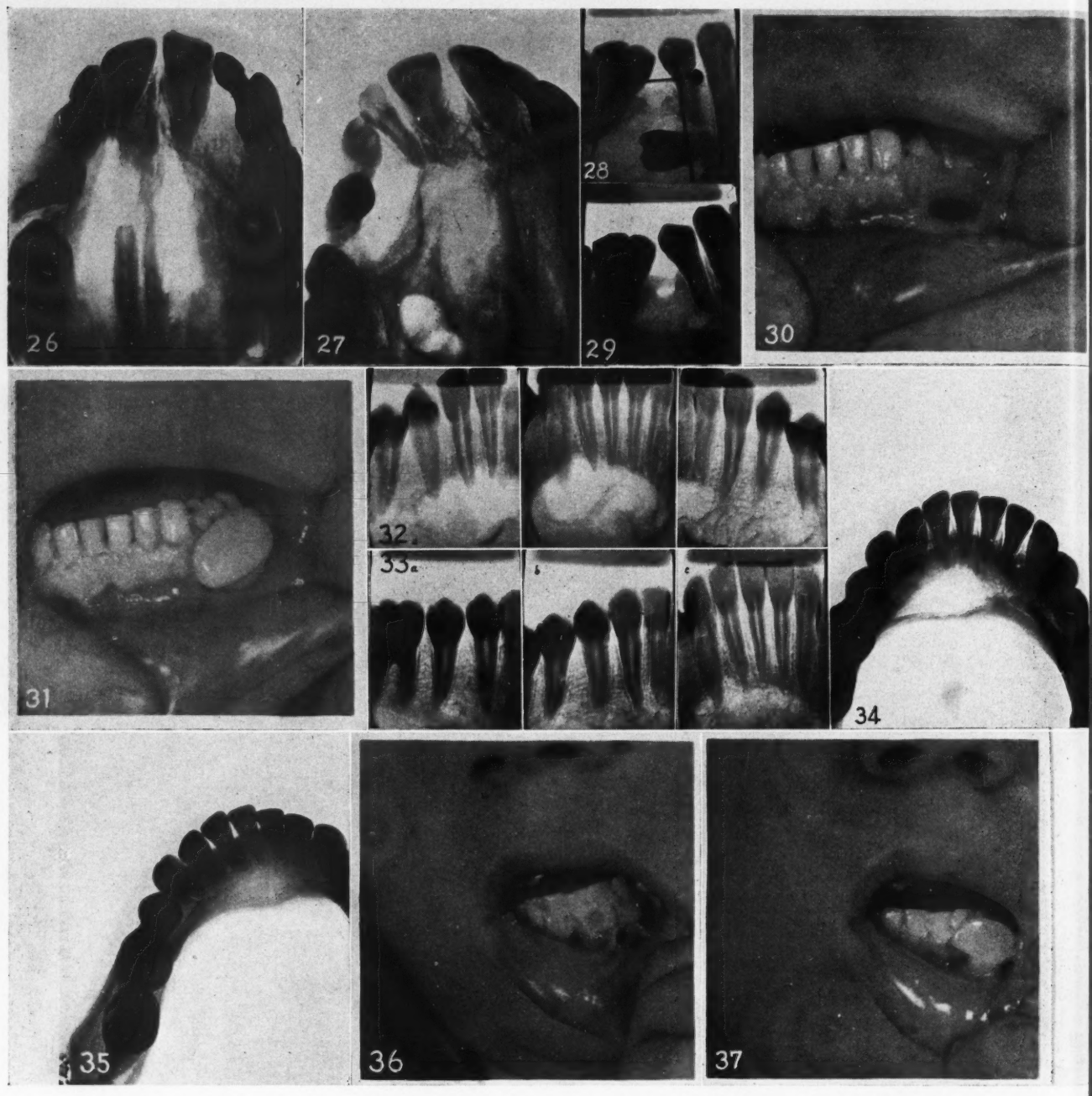


Fig. 26—Case 5—Postoperative roentgenogram taken May 9, 1932.

Fig. 27—Case 5—Postoperative roentgenogram taken November 15, 1932.

Fig. 28—Case 6—Before operation (December 7, 1931). Diagnostic needles show extent of cyst and location of tooth.

Fig. 29—Case 6—After operation (April 18, 1932).

Fig. 30—Case 6—Cyst cavity ten days after operation.

Fig. 31—Case 6—Obturator in place.

Fig. 32—Case 7—Preoperative roentgenogram (December 28, 1931).

Fig. 33—Case 7—Postoperative roentgenogram (May 13, 1932).

Fig. 34—Case 7—Preoperative roentgenogram (December 28, 1931).

Fig. 35—Case 7—Postoperative roentgenogram (May 13, 1932).

Fig. 36—Case 7—Cyst cavity ten days after operation.

Fig. 37—Case 7—Obturator in place.

and fluid could be palpated, showing the absence of bone on the hard palate. The swelling on the hard palate can be seen in Fig. 9; actually the swelling was the size of an English walnut. All teeth in the upper jaw were vital except the left lateral incisor. At the time of operation all the upper anterior teeth and the posterior teeth on the left side were exceedingly loose and could easily have been extracted with the fingers.

An open operation was done and all

the teeth were allowed to remain. None of the roots were seen or exposed during the operation. Note the thin and frail bony support of the anterior teeth at the time of the operation (Fig. 14).

The wound was dressed with iodoform gauze until November 6, 1931, when an obturator was placed. The obturator worn by this patient was used until June, 1933.

The patient returned monthly to have the obturator reduced in size as necessary.

A postoperative roentgenogram was made April 5, 1932. A careful comparison of these roentgenograms shows evidence of bone regeneration and healing. Within two weeks after the operation, the teeth began to tighten, and at present are solid; the patient is able to masticate any type of food comfortably. The cyst has entirely healed now and scarcely shows a scar.

CASE 4—Mr. W. W. presented for operation on October 23, 1931, for a moderate sized cyst in the region of the upper left lateral incisor. All the teeth in the region of the cyst responded to the electric vitality test, except the left lateral incisor.

An open operation was performed and no teeth were removed. The wound was dressed with iodoform gauze until October 30, 1931, when an obturator was placed in the cyst cavity. The obturator was reduced in size monthly until January 5, 1932, when it was removed permanently.

A postoperative roentgenogram was taken February 2, 1932. An examination of this roentgenogram (Fig. 20) shows marked evidence of bone regeneration when compared with the preoperative roentgenogram (Fig. 19).

CASE 5—Mr. G. S. presented for operation November 2, 1931. The cyst was the largest encountered since this study began. It involved the entire right maxilla extending from the right third molar, sweeping across the median line and extending to the upper right central incisor. A good idea of the size of this cyst may be had from a study of the roentgenogram (Fig. 25) and also from the photograph (Fig. 21) showing the large swelling of the hard palate on the right side. The patient reported that the cyst had been incised twice before he came to us.

As in the other cases reported, an open operation was done under local anesthesia. None of the teeth was disturbed at the time of the operation.

The wound was dressed with iodoform gauze until November 12, 1931, when an obturator was placed in the cyst opening. The patient returned every two months to have the obturator reduced in size as indicated.

Because of the size and extent of this cyst, postoperative roentgenograms were not considered necessary until six months after the operation. A roentgenogram was taken on May 9, 1932. A comparison of this roentgenogram with the original discloses an appreciable amount of bone regeneration.

The patient wore the obturator in this case until November 15, 1932, the date of the last roentgenogram.

CASE 6—Mr. P. V. presented for operation on December 7, 1931. A dentigerous cyst was located in the lower left bicuspid region which contained an impacted bicuspid. The location of the impacted tooth and the cyst was made by means of diagnostic needles. A typical open operation incision was made and the impacted tooth was removed with minimum trauma. The mucous membrane flap was then sutured to the cyst wall remaining, and the opening packed with iodoform gauze.

The wound was dressed with iodoform gauze until December 21, 1931, when an obturator was placed. The obturator was used by the patient until April 18, 1932, when it was discarded permanently, and the patient was dismissed.

Postoperative roentgenograms made April 18, 1932, showed clear evidence of bone regeneration.

CASE 7—Miss D. K. entered for operation on December 28, 1931. All the clinical manifestations of a traumatic cyst of the mandible were present, such as Blum[5] describes. The patient, a girl, aged 14, gave a history of having received a blow some time ago. The case first came to our attention in September, 1929. At that time, a small area of rarefaction appeared in the lower left cuspid region. The next time the patient was seen was November 21, 1929. At that time there was a large area of rarefaction extending from the lower left cuspid region to the right lateral region. The patient returned January 20, 1930; October 3, 1930, and June 11, 1931, and each time was advised to have an operation, but the parents would not consent. Finally, the patient returned again on December 28, 1931, and an open operation was performed.

A large flap was laid back over the buccal surfaces of the left cuspid, lateral, and central. At this time all teeth responded weakly to the electrical pulp test. The buccal plate of bone was of egg-shell consistency, and a considerable portion was removed to obtain a good view of the interior of the cyst.

The cyst was absolutely devoid of any lining cystic membrane. The roots of the teeth could be plainly seen. Iodoform gauze was then packed lightly into the cavity, so that the mucous membrane flap was pushed into the aperture. There was straw colored fluid mixed with blood in the cavity which was aspirated before the cavity was packed.

The iodoform gauze dressing was changed every other day until January 13, 1932, when an obturator was placed in the opening. The obturator was worn until March 11, 1932, when it was no longer necessary.

A postoperative roentgenogram was taken May 13, 1932. A study of this roentgenogram shows a complete bone regeneration at approximately five months after the operation was performed. This rapid healing was no doubt due in part to the patient's age and general good physical condition.

CONCLUSION

As already stated, the purpose of this study was to discover whether an obturator could be employed which would overcome satisfactorily the objections or disadvantages of the open method of operation specified, and which at the same time would not prove a hindrance to regeneration of bone.

The actual results obtained are best appreciated by an actual clinical examination of the patient before and after operation. However, a careful study of the postoperative roentgenograms compared with the roentgenograms made before operation will disclose positive evidence of bone regeneration in all cases reported.

It was my privilege to present this problem to the late Doctor Thomas L. Gilmer. Up to the time of his death Doctor Gilmer observed several of these cases, both roentgenographically and clinically, with the obturators in actual use. He was enthusiastic, and it was his opinion that the use of these obturators should be encouraged following the Partsch operation in the mouth.

Doctor Gilmer was especially impressed by the speed with which healing took place, and said that the obturator acted as a constant and gentle stimulant for the formation and filling in of new bone into the cyst cavity.

Doctor Herbert Potts, Professor of Oral Surgery at Northwestern University recommends the use of an obturator following the open operation, but stresses the importance of reducing its size as healing progresses, so that it cannot hinder bone growth. With the obturators employed in the cases cited, the plug of the obturator in all cases was reduced several times during the healing process, apparently with only the most satisfactory results.

The use of the obturator in these cases has successfully overcome the objections of the open method of cyst operation; namely, it prevents the cyst cavity from granulating across, so that recurrence is virtually impossible; it covers the opening of the cyst cavity and is comfortable to the patient; it prevents food and débris from lodging in the cyst cavity; and it helps to maintain the normal contour of the jaws, so that no permanent deformity will result.

So far as the stimulating action of the obturator is concerned, little can be said at this time. However, we do feel that there is some foundation for this belief because the cysts for which the obturators are used seem to be healing more rapidly than similar cysts did in the past before such an appliance was used. At least it can be said with certainty that the filling in process was not retarded, and the rate of healing compares favorably with cases reported in which no obturator was employed.

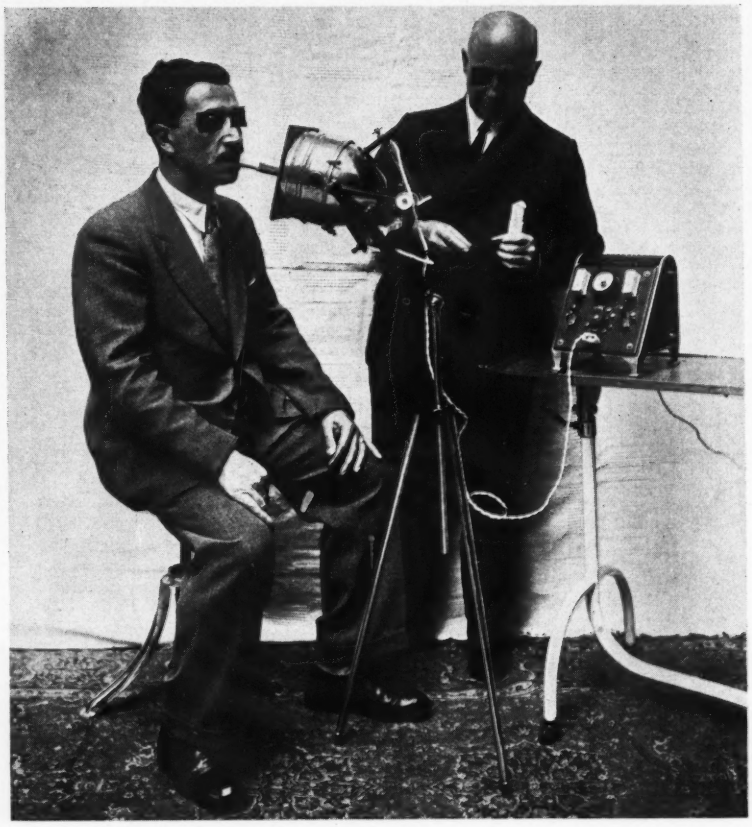
25 East Washington Street.

[5] Blum, Theodore: Unusual Bone Cavities in the Mandible, J. A. D. A. 19:281-301 (February) 1932.

ULTRAVIOLET RAYS IN DENTISTRY

WILLIAM DUNN, D.D.S.
London, England

ULTRAVIOLET rays occupy on the spectrum the region just beyond the visible violet; they merge almost into the sphere of x-rays on the other side; they are intensely active; they move along with the speed of light; many millions of them can dance on the point of a needle. When we have mentioned these facts, I believe, for practical purposes the ground has been covered sufficiently, and all that need be discussed is what ultraviolet rays can do for the busy dentist in his everyday practice.



The dentist is holding the "straight" mouthpiece (for incisor region) in his left hand and is holding a watch in his right. Applications, normally from fifteen to twenty minutes.

Choice of Ultraviolet Lamp

Ultraviolet ray lamps are divided into two main classes: in one the incandescent vapor-of-mercury is used as a source of rays and is therefore called the vapor-of-mercury lamp, or the quartz lamp, because the mercury is enclosed in a quartz globe. In the other class, incandescent carbon rods are used as a source.

The nature and properties of the rays emitted vary according to the source. While the vapor-of-mercury lamp emits, together with ultraviolet rays, radiations of a violently caustic nature, so that the lamp must be used with extreme care and for brief sittings, the rays emitted by incandescent carbon rods that have been specially prepared are efficacious and entirely free from danger.

Scaldings by vapor-of-mercury irradiations are frequent, and devastating effects on tissues, especially in children, have been reported. These harmful effects to my knowledge have not been reported from carbon arc lamps. It is said that *when measured by photo-electric standards,* the vapor-of-mercury is the more powerful. I do not doubt it, but the risk is too great.

The carbon arc lamp has plenty of reserve energy in it; far more, in fact, than is necessary. Again, on more scientific grounds, since quartz (in which the vapor-of-mercury is contained) cannot allow the shorter rays to pass, and the shorter rays are the therapeutically more useful ones (quartz being impervious to radiations below 1500 Angstroms), rays produced by carbon arcs have the advantage, since the patient receives the full number of rays emitted, through a few inches of atmospheric gases: the only screen between the rays and the patient. The spectroscope clearly reveals this.

The lamp I use is an Arnone Italian lamp for ultraviolet rays. It is well built; is easily managed (even by an assistant or by the patient himself), is easily packed and carried in a handbag, and always ready for use by simply plugging on direct or alternating lighting circuit.

The carbons (a couple will suffice for eight or ten applications) are made from the finest lamp-black; Professor Arnone of the University of Florence worked long and patiently at them; he would complain of impurities, chief of which was calcium, to which he attributed some of the violently caustic rays. He has given us carbons which, though rich in ultraviolet rays (as the spectroscope reveals) are absolutely free from the danger of scalding.

A practical way to reveal ultraviolet rays is by making a 10 per cent solution of quinine sulphate in distilled water in a test tube, clearing by a couple of drops of pure sulphuric acid. This solution becomes an opalescent blue when exposed to ultraviolet rays.

The difference in penetrating power will be noted between ultraviolet rays from a carbon arc lamp, which one can pick up through 3 inches of plate-glass, compared with rays from a quartz lamp, which stop dead on the surface glass.

What the Lamp Does

In the dental office the lamp for ultraviolet rays has proved to be valuable in many cases; perhaps the most noticeable and remarkable effects have been proved in painful eruption of third molars. Swelling, inflammation, continuous pain, difficulty of opening the mouth are not effectively relieved by mouthwashes. I have had patients who after a night and a day of suffering have been relieved by one application of ultraviolet rays. The pain has not only been mitigated; it has entirely disappeared in a few minutes; the patient has gone home and has been able to rest. *How* the rays act in such cases, it is difficult to explain.

In cases of excessive sensitiveness at the necks of the teeth; cases in which the dentine cannot even be approached with cotton-wool, and in cases of foul secretions, the rays have painlessly restored normal sensitiveness in two or three applications.

The ultraviolet rays are also efficacious in cases of Vincent's infection.

59 Havter Road, Brixton Hill.

I have had some cases in which the sloughing and the destruction of tissue entirely ceased after two applications. In some of the cases, in which the patient had ulcerations and sloughing on the lingual aspect, Vincent's infection was cured by applying the rays on the buccal aspect of the gums, which proves that the rays will not only penetrate living tissue, but will retain their curative value in doing so. These cases have necessarily taken longer to heal, but they have yielded.

In many cases of trigeminal neuralgia the rays have proved useful. Pyorrhea also is invariably favorably influenced. Loose teeth will tighten, sometimes permanently, after these applications.

In ulcerations of the mucous membrane (barring, of course, specific conditions); in wounds of the mouth and gums, surgical or accidental, these rays have healing and sterilizing value.

Ultraviolet rays are not a cure-all, and when cells are dead, ultraviolet rays will not call them to life again; but there is no doubt that they are beneficial in eliminating necrotic tissue and in stimulating healthy granulations. In every case of fistulous opening in which I have applied the rays, there has been, after the first sitting, an increase of expulsion of pus (and the patient ought to be prepared for this); but this increase of draining from the fistula has invariably been followed by granulation, with cell-proliferation of a healthy nature, tending to fill the pus-forming cavity and fistula. Under these conditions, amputation of the necrosed root-apex will certainly effect a cure, with the help of the ultraviolet rays. These rays have power to heal ulcerated or sloughing surface in the mouth.

The rays should not be applied on teeth with a congested pulp. The pain will become worse. But if the pulp is exposed, the rays give no pain, because of the heat rays that accompany the ultraviolet rays.

DENTURE SPACE OR VERTICAL DIMENSION

MELVIN E. PAGE, D.D.S.
Muskegon, Michigan

WHEN we see denture-wearing patients for the first time, they usually present with loose and uncomfortable dentures as a result of the shrinkage of the underlying process. Often the patient himself is unaware that this change is the main cause of his appearing older. Generally by a little experimentation, and by the use of old photographs of the patient, his enthusiastic cooperation is secured.

1. To establish the approximate vertical distance, wax may be built up on the occlusal surfaces of the lower denture and the esthetic results noted.

2. When the approximate vertical opening has been estimated, the dentures may be relined with compound to secure this vertical opening. This will take a full hour to do properly but the results are well worth the time.

3. The upper denture is dried thoroughly and heated slightly on the tissue surface, with a small blow-pipe flame. The patient is instructed to close and the denture is pressed backward by the operator so that too much compound will not be in the labial portion. This impression is removed and chilled; dried thoroughly; flamed with a small flame, and tempered; then reinserted until a smooth even surface is obtained and the fit is good.

4. The same procedure is followed with the lower. The operator should be sure to have the condyles retruded. If the patient reaches forward to get the proper occlusion, more compound must be expressed until the dentures occlude properly. The borders are then dried and flamed, after which they are chilled to obtain a glaze. After a slight flaming, they are tried in again.

Advantages

By the method described the original vertical dimension is restored. Any soft inflamed tissue is reduced, unless the inflammation is excessive, and the mouth is put in condition for impressions at a later appointment; also the vertical dimension is established in such a way that it can be readily changed if not satisfactory. Usually the patient is made more comfortable than he has been in a long time. Not the least advantage is that the patient is likely to request new dentures.

Comment

These compound relined dentures may be worn as long as two weeks, if the patient is instructed to wash the dentures only in cool water. It may be necessary to reline them again at the end of this time, if conditions can be further improved; but usually at the end of three or four days, the mouth is ready for impressions.

Often the lower relined denture may be used as the impression itself, if it has been worn too long and the comfort and fit is as it should be. Too often, however, the old lower was not extended enough posteriorly, and a cast tray and new impression are indicated.

The procedure described changes a baffling problem to an easy one and contributes more to the building of a denture practice because of the resulting improvement in the appearance of the patient than any single procedure with which I am acquainted.

THE CONSTRUCTION OF AN ALL-CAST RICHMOND CROWN

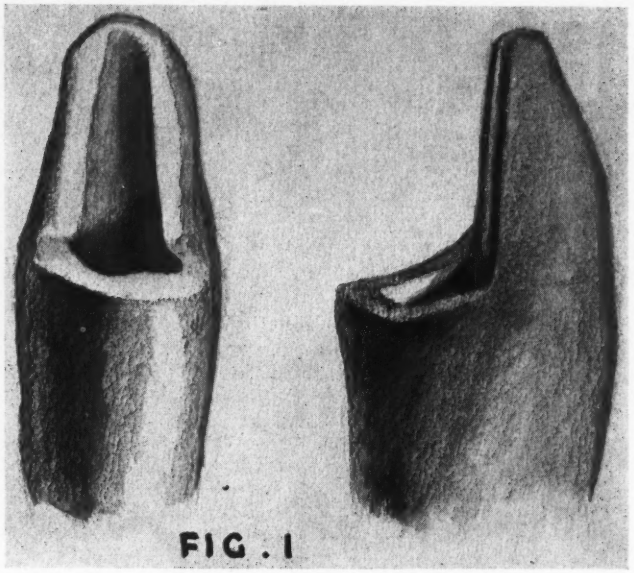
A. B. ADELSON, D.D.S.
Chicago

WHEN an anterior pulpless tooth has to support a bridge the choice of restoration for that tooth, whether it is a thimble jacket, a porcelain veneer, or a Richmond crown, will depend on the economic status of the patient. In the majority of cases in the average practice the choice will be the Richmond crown.

The Richmond crown, if properly constructed, makes a fairly good restoration. It compares favorably with the porcelain veneer as to appearance, but it has a disadvantage in that it is necessary to cut away too much sound tooth structure; for this reason, many operators will hesitate to place a Richmond crown and will strongly recommend the porcelain veneer even if it is beyond the means of the patient.

A method for the construction of a Richmond crown whereby the lingual surface of the tooth is preserved is described here. The necessity of the band is obviated, thereby preventing gingival irritation. Furthermore, the post can be made shorter because it is stronger as a result of the preservation of the lingual portion. Another advantage in my method is the saving of time owing to the fact that the restoration is made in one casting. Incidentally, there is also a saving in gold.

An upper cuspid is used to demonstrate the technique.



Proximal and labial view of preparation.

MATERIALS AND THEIR USES

1. Copper plate, 36 or 40 gauge: To facilitate breaking of model.
2. Copper tube: To carry inlay wax for impression of tooth.
3. German silver wire, 18 gauge: To obtain canal impression.
4. Sheet casting wax, 22 gauge: To form post for Steele's facing.
5. Sheet casting wax, 30 gauge: To form backing for Steele's facing.
6. Inlay wax: To obtain impression of tooth.
7. Bite wax: To obtain impression of adjacent teeth.
8. Sticky wax: To remove Steele's facing.
9. Investment material, hard: To form model.

TECHNIQUE

Preparation of Tooth—1. The labial surface is removed to allow the placing of a Steele's facing with a 30 gauge wax backing (Fig. 1). The copper band is fitted before the labial is cut away. While the labial is being removed, the operator should have the facing at hand to grind it in on the tooth. This will be a good guide as to how much labial structure is to be removed in order to have the facing in correct alinement.

2. The operator grinds away as much from the lingual as he would for a three-quarter crown to allow sufficient bulk of metal for the lingual. The proximal surfaces are made parallel.

3. The canal is opened to the desired depth.

Taking the Impression—1. One end of a piece of German silver wire, 18 gauge, is formed into a loop; the other end should enter the canal with the loop portion projecting a few millimeters over the canal opening (Fig. 2, A). Remove the wire and have it ready at hand.

2. Form pink casting wax into a post to fit the canal. Soften it slightly, and insert it firmly into the canal so as to fill it. Cut off projecting portion flush with canal opening.

3. The prepared German silver wire is heated and inserted in the wax-filled canal as far as it will go, with the loop projecting a few millimeters (Fig. 2, B). Chill and remove. This gives a correct canal impression. Dip the impression in alcohol; return it to canal, and move it in and out a few times. Alcohol, being a slight solvent of wax, it will facilitate the next step.

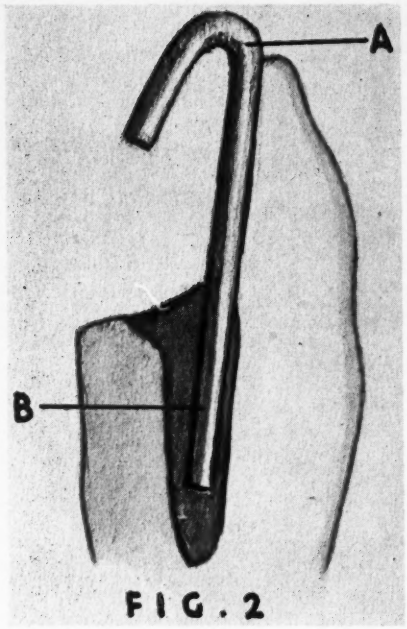


FIG. 2

Canal impression with loop (A).

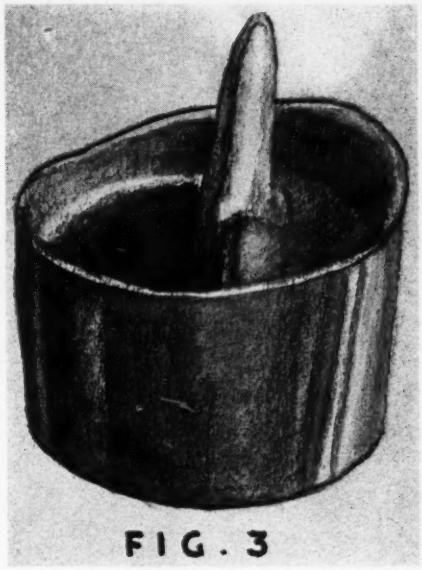


FIG. 3

Tube impression.

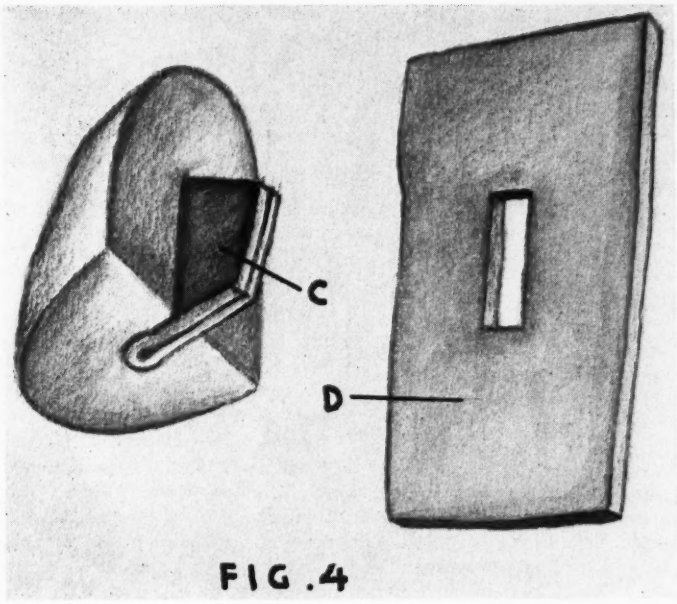


FIG. 4

Model (lateral view) showing facing in position.

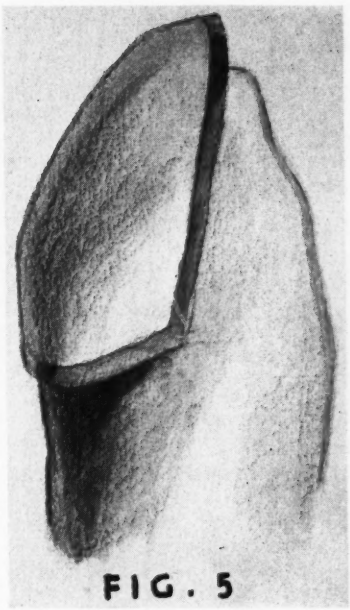


FIG. 5

Model (lateral view) showing complete wax-up.

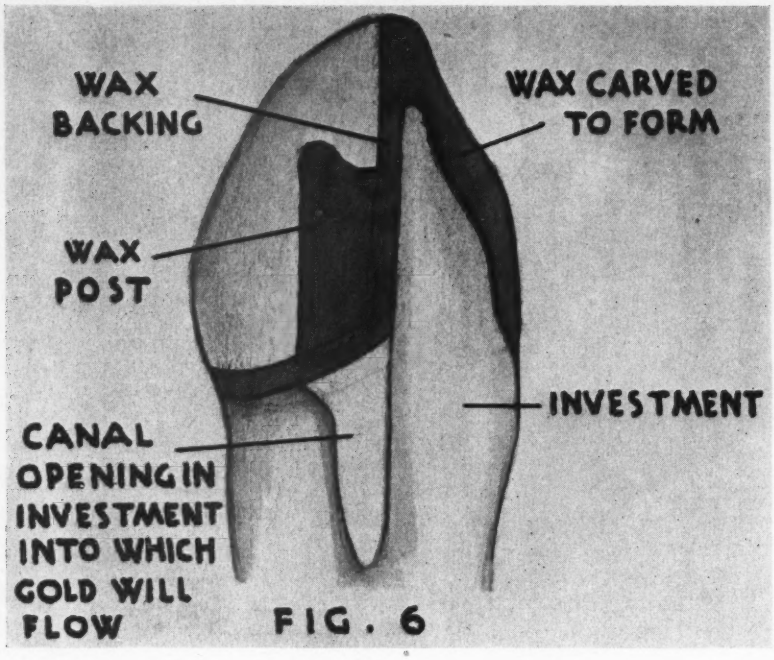
4. The canal impression is placed in the canal. Fill the previously prepared copper band with soft inlay wax and press it over the tooth and projecting loop. Chill and remove. The canal impression will attach itself to the tube impression by means of the loop. A complete impression of tooth and canal is thus obtained (Fig. 3). Place the impression back on the tooth.

5. A small impression tray is filled with softened bite wax and pressed over the tube impression and adjacent tooth. Chill and remove. The tube impression will as a rule come away with the tray impression; thus, three impressions are obtained in one: the impression of the canal, the impression of the tooth, and the impression of the adjacent tooth.

6. A piece of copper, 36 or 40 gauge, is placed between the tube impression and adjacent tooth in labio-lingual direction.[1]

Pouring of Model—A hard investment material is used, one that has a thermal expansion proportional to the contraction of gold on cooling. The material is mixed thick, being vibrated into the tube impression first.

[1] Adelson, A. B.: Cast Restoration with Porcelain on Occlusal or Buccal Surfaces, DENTAL DIGEST. 39:22 (January) 1933.



Wax backing.

Finished casting.

Care must be taken not to trap any air bubbles.

Waxing of Model—The Steele's facing having been ground in on the tooth in the mouth is now placed on the investment model of the tooth and the final corrections of the facing are made. A wax backing, 30 gauge, is adapted to it and placed on the model in position (Fig. 4). The facing is attached with wax; all surfaces of the model tooth are covered with wax and carved to form (Fig. 5). The facing is removed and cast.

Forming the Wax Backing—1. Lubricate the post hole and lingual surface of facing (a drop of engine oil will do); cut a square piece of pink casting wax, 22 gauge, a little larger than the desired length of the post; warm the wax slightly and fold it in two. Insert rounded side of folded wax in opening of the post hole at ground portion of facing, exerting gradual pressure toward labial and incisal until the wax reaches the incisal end of post hole. Remove and if satisfactory place it back in position; cut away the gingival excess of wax flush with the ground portion of the facing. On the lingual, the wax projects a few millimeters.

2. Cut a piece of 30 gauge wax, larger than the desired backing; cut a slot in it to fit the projecting wax on lingual of facing and slip it over the projecting lingual wax of facing.

3. With a hot instrument soften the projecting wax from the slotted backing; with thumb on wax and index finger on labial of facing, flatten it over the 30 gauge wax. This will accomplish two things: it will unite the wax post with the wax backing and will adapt the wax backing to facing. Reinforce wax backing with inlay wax up to ground portion of facing. (Wax is *not* added to backing of ground portion of facing in order to prevent the display of gold on the labial). Remove all excess of wax from backing; place facing with wax backing on model (Fig. 5). Attach with wax; carve to form (Fig. 6). To remove facing, warm one end of a stick of sticky wax and attach it to labial of the facing; then gently coax out the facing.

Conclusion

By following this technique, a better Richmond crown can be produced because of the elimination of the band and the added strength secured by utilizing the lingual surface of the tooth. Better retention and a safeguard against fracture of the root from excessive pressure toward the labial is thus obtained. In appearance, the Richmond crown compares favorably with a porcelain veneer and it surpasses it in strength.

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The Editor's Page

CLIFFORD J. BARBORKA, M.D.[1] has recently written a book entitled TREATMENT BY DIET. Doctor Barborka was formerly on the staff of the Mayo Clinic and is at present on the faculty of the Northwestern University Medical School. The subject of treatment of disease by diet (dietotherapy) is one that has been chock-full of the fantastic and absurd. It is refreshing, therefore, to find in the first paragraph of Doctor Barborka's book this assurance: "There is no field of human thought in which sentiment and prejudice so completely take the place of sound judgment and logical thinking as in dietetics." And the promise that there is nothing faddy or spectacular in the presentation is fulfilled.

To those students of the problem who believe that dental caries is a disease of civilization, the discussion in this book on the evolution of the American dietary should be of interest. The consumption of sugar, for instance, has steadily increased in the American diet from 8.8 pounds per capita in 1823 to 108 pounds per capita in 1931; whereas the use of meat protein has tended to decrease. "Thus the American diet contains a large proportion of concentrated food, low in vitamin, residue and alkaline minerals, and high in carbohydrate and acid minerals." If dental caries is partly caused by avitaminosis and deficiencies in mineral elements plus the presence of aciduric micro-organisms, the present status of the American diet may be a contributing factor.

The chapter on dental caries in this book presents no new evidence or experimental data, but it is an excellent summarization of the extent of our knowledge regarding this disease. Doctor Barborka wisely refuses to go further than to say: "The information accumulated thus far on the relation of diet to dental caries points to the fact, at least, that an inadequate diet produces nutritional conditions that predispose in the causation of dental caries." The author also shows his appreciation of the extent of the caries problem when he insists that it is one to be approached by the combined and cooperative interests of groups of workers: dentists, physicians, biochemists, nutritionists, and bacteriologists.

According to Doctor Barborka, diet is of paramount importance in the treatment of the following diseases: diebetes mellitus, gout, nephritis, pernicious anemia, peptic ulcer, and the deficiency diseases. In all other disease processes, dietotherapy is of varying degrees of importance. Although the book contains specific and concrete suggestions for both quantitative and qualitative food elements for disease conditions, the author is careful to point out the danger of shotgun prescriptions and emphasizes particularly that "diets must not be used as a stock or printed list for a particular disease applied to all patients."

In a day when newspapers are flooded with dietary suggestions emanating from faddist sources and carrying such promise as the Hollywood diet, the Seventeen-Day diet, and other geographic and temporal slogans, it is time that a competent authority, such as Doctor Barborka, has written an accurate book on dietotherapy for the guidance of dentists, physicians, nurses, dieticians, and other workers in the health field who are trying to counteract the possible harm of these self-imposed diets.

The principle involved in the present tendency to encourage dentists to understand the fundamentals of nutrition and food values is commendable, but dentists must not forget the necessity to cooperate with physicians in the prescribing of dietary régimes for individual patients. A given patient may be suffering from a gastrointestinal disorder, such as colitis, in which case the excess intake of fruits or fruit juices that the dentist may prescribe for the control of dental caries, such as Hanke advocates, may prove positively injurious to the patient. The ideal arrangement would be, it seems, for the dentist to consult with the physician, especially in doubtful cases, to determine a diet compatible with the dental and medical needs of the patient.

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[1] Barborka, C. J.: Treatment by Diet, Philadelphia, J. B. Lippincott Company, 1934.

IMMEDIATE MAXILLARY DENTURES

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New York

IN THE broad field of dental prosthesis no procedure has proved so helpful a service to my patients, or given me more personal satisfaction, than the construction of immediate maxillary dentures. It was adopted at first as a stop-gap method of supplying something to wear for patients who refused to appear in an edentulous state; it has developed into a routine procedure followed in every case in which the opportunity is afforded.

Used intelligently, the immediate denture smooths the path of both the operator and patient over one of the most difficult dental problems. It enables the dentist to build an appliance that is actually restorative since the matter of the correct arrangement of the anterior teeth is simplified, and the procedure of taking the bite, an important step which is in edentulous mouths often fraught with difficulty, is one that will present no special problem when this technique is followed.

From the patient's standpoint the fact that he is never without teeth is perhaps most important. The loss of the anterior maxillary teeth is a condition that in most mouths is at once apparent, and the patient who is spared the resulting embarrassment of faulty speech and altered facial expression is appreciative of the distinct service that his dentist has rendered in constructing immediate dentures.

The steps in the technique outlined here can, of course, be modified to suit the needs of the individual operator. They have been carefully and practically worked out, however, and will serve as an adequate outline for those who care to adopt a conservative method of immediate prosthetic replacement.

Preparation of the Mouth

All the remaining teeth are extracted posterior to the first bicuspid on one side, and posterior to the cuspid on the other side of the mouth. Patients who have arrived at the point where a full upper denture is indicated have, as a rule, lost many posterior teeth, but have clung to the anterior teeth when possible for the sake of appearance, probably for some considerable time after most posterior teeth have been lost. It seems to be acknowledged good practice not to extract too many teeth at any one time, and the procedure of removing the posterior teeth, leaving the anteriors to be extracted later, thus meets with the approval of the surgeon as well as the prosthodontist.

Length of Time Before Taking Impression

The time allowed to elapse between the extraction of the posterior teeth and the taking of the impression is governed by the rate of healing. If the teeth removed had periodontal disease, healing will take place rapidly; if they were firmly in place and the bony process was not well smoothed after the extractions, healing will, of course, be slower. As soon, however, as the ridges can withstand pressure of the finger without undue soreness, it is time to take the impressions.

Advantages of Modeling Compound

In my hands a modeling compound impression taken sectionally gives the best results. There is no doubt that other materials can be used and a good denture made from the resulting impression, but I would urge that compound be tried, because it offers many advantages. It enables the operator (1) to take the impression under pressure; (2) to determine by knife trimming and by muscle trimming the limits of tissue tolerance; hence (3) to determine ex-

Fig. 1—A Supplee, number 5 tray. I keep only this large tray on hand because it is easy to trim a large tray to a smaller size and it is not necessary to keep a variety of sizes.

Fig. 2—Tray cut and bent to fit case.

Fig. 3—A sheet and a half to two sheets of compound piled on tray and ready to be carried to the mouth.

Fig. 4—Impression which has been roughly knife-trimmed after removal from the mouth. There has been no attempt to obtain detail in this impression. It is now to be surface-heated with an alcohol blow-pipe and returned to the mouth.

Fig. 5—View of the primary section of the impression after the second insertion which shows the sharp detail well registered.

Fig. 6—The primary section of the impression on a plaster cast to show where and how to trim the key-way surfaces and the key-ways. Note that there are 4 mm. or more of compound between the incisal edges of the teeth and the tray.

Fig. 7—A holding instrument made from an old elevator. The sharp point is placed in the center of the palatal portion of the impression; the patient grasps the handle, and with an upward pressure maintains the primary impression in place while the operator adapts the labial section. This instrument is 6 inches long.

Fig. 8—Primary impression after it has been scraped to relieve pressure on hard area and after it has been postdammed. The second section with the sharp detail of the labial surfaces of the teeth and tissue clearly shown is ready to be fitted to the primary section. After the pieces are secured together the model is poured.

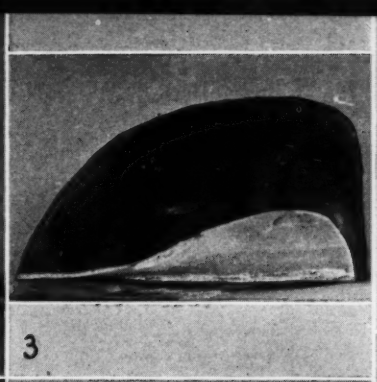
Fig. 9—Casts mounted on articulator with shellac base plate and attached wax bite blocks in place. (The teeth on the lower model are amalgam.)

Fig. 10—Position of casts on articulator after having been mounted in centric relation. (The anterior guide pin is raised so that the casts may be more readily seen.)

Fig. 11—If a Gysi "Simplex" articulator is used which has a fixed incisal guide inclination of thirty degrees it may be changed to a zero or flat incisal guide by adding sizzling hot compound to the metal guide plane and to this hot compound adding a piece of flat metal of suitable size, as is here illustrated.

Fig. 12—Articulator manipulated to bring about a cuspid to cuspid relationship of upper to lower cast. When this relationship is established the incisal pin is dropped to meet the incisal guide plane, and the set screw tightened to lock the guide pin in that position. This operation determines the amount the bite must be opened to allow the teeth to be set up so that they will balance in lateral excursions of the mandible.

Fig. 13—The articulator is allowed to return to centric position. The amount the bite has been opened may be seen by comparing this illustration with Fig. 10. (Cases with a deeper vertical overbite require, of course, a greater degree of opening.)



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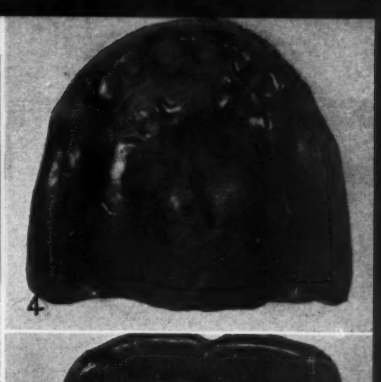

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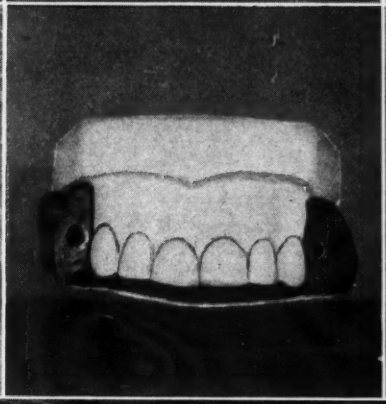

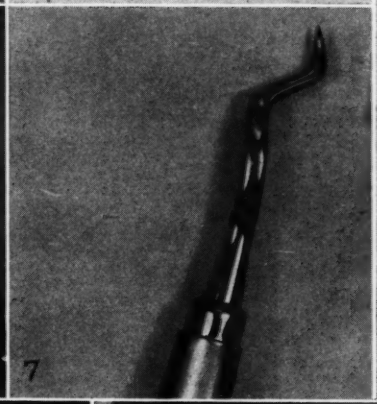

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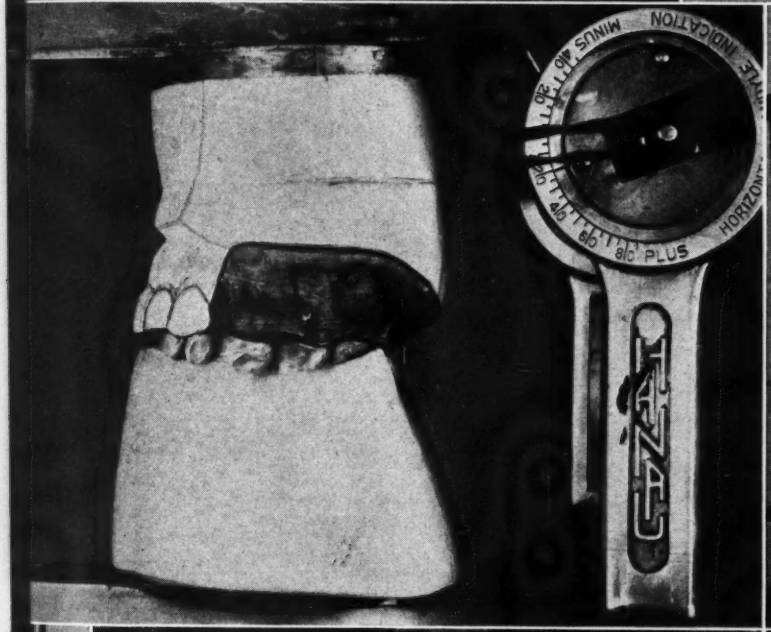

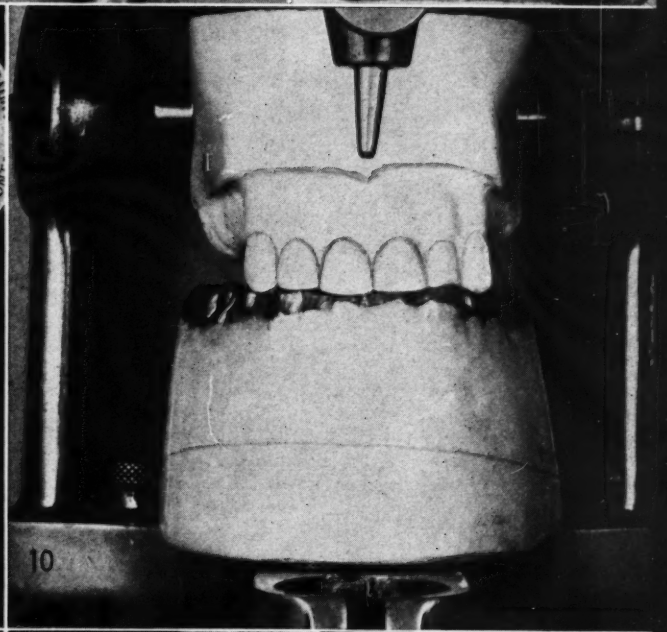

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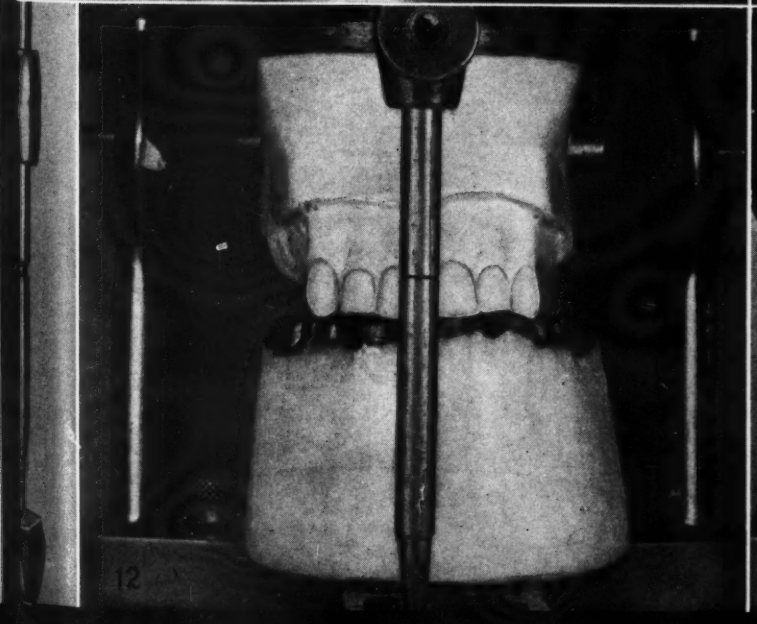

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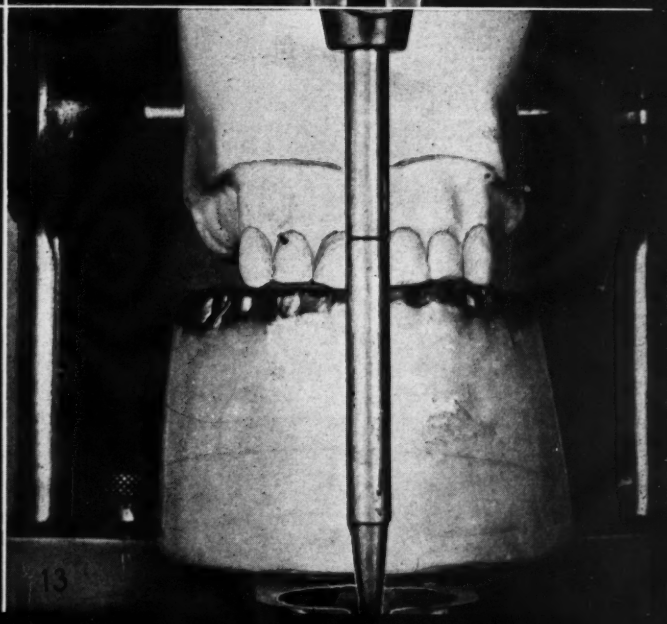

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actly the amount of tissue surface that can safely be utilized to support the denture; (4) it enables him to postdam with accuracy; (5) its use will result in an impression in which there will be sharp definite detail of the teeth as well as of the tissue, an important factor in this technique.

Impression Technique

1. A Supplee, number 5, upper tray (Fig. 1) is trimmed to proper length, the lateral flanges are bent with pliers to conform approximately to the shape of the ridges at the heels, and any portion of the lateral flange which projects beyond the labial surface of bicuspid on one side, or cuspid on the other, is trimmed away (Fig. 2).

2. From a sheet and a half to two sheets of modeling compound are softened in water at 130° F. and molded on to the tray (Fig. 3).

3. The tray with the compound is carried to the mouth and gently put into place, care being taken to see that the tray is properly centered. No great amount of pressure is applied at this time; in fact, caution must be exercised not to press the tray up too far. Six millimeters of compound should be left intervening between the incisal edge of the teeth and the tray.

4. With one hand holding the tray in place, the cheeks are manipulated with the free hand roughly to muscle trim the impression.

5. After a lapse of one minute, the mass is removed from the mouth, then chilled with cold water.

6. With a *sharp* knife the excess compound is cut away from the posterior border of the impression, and from the labial or buccal surfaces of the teeth.

7. The impression is now dried and any chips of compound are blown away with compressed air (Fig. 4).

8. The entire surface of the impression is softened with an alcohol blow-pipe flame to a depth of 3 mm.; the impression is immersed for a few seconds in hot water (so that it will not burn the patient).

9. It is again carried to the mouth, inserted, and properly centered. It is now *firmly* pressed into place, and the softened surface compound, backed up as it is with a hard underlying mass, will register all the minute detail looked for in a good impression.

10. The tray is held firmly in place with one hand, and the muscle trimming may now be corrected by manipulating the cheeks and pressing the compound, which lies beneath these tissues, firmly into place.

11. When this step is completed, the impression is chilled and removed from the mouth, washed with cold water, and dried. With the knife, any excess compound is trimmed away, and the borders of the impression around the teeth are trimmed to flat surfaces and sharp angles, as is shown in Figs. 5 and 6.

12. With an indelible pencil there is now traced on the vault of the mouth at that point nearest the junction of the hard and soft palates, where the compressible soft tissue is *not* in motion when the patient says "Ah," a line that will define the posterior border of the denture, and other lines outlining any hard areas that will need relief from pressure in the finished denture. The impression is carried to the mouth, and held in place for a few minutes, in order that the indelible pencil marks may be transferred to the compound, and the impression is again removed.

13. The hard areas are now relieved by scraping the impression where the indelible transfer indicates the need; the posterior border of the impression is trimmed to the indelible pencil mark that indicates the farthest point posteriorly to which it is thought the finished denture can be tolerated.

Postdamming

Black carding wax is now flowed onto the posterior border of the dry impression in a strip, from 4 to 5 mm. wide and 1.5 mm. in thickness. This is softened with a rapid flaming of the blow-pipe and quickly carried to the mouth, *very firmly seated,* chilled, and removed. If the carding wax has not flowed distally and rolled down slightly over the sharply trimmed compound along the posterior border of the impression, the postdam is insufficient and more carding wax must be added to complete the seal. A proper postdam seal is an important factor in the success of the denture and care should be taken to execute this step accurately (Fig. 8).

Anterior Section of the Impression

We now have an impression which gives in detail all the data we can use regarding the palatal tissue (this tissue, by the way, is the part that carries nearly all the stress of the denture), and the labial, and incisal edges of the remaining teeth. We now must take an impression which will include the anterior maxillary tissue and the labial surfaces of the teeth.

1. Key-ways, of whatever shape best suits the operator, are carved in those surfaces of the initial impression that have been already squarely cut when the excess compound was trimmed away (Fig. 6).

Fig. 14—Posterior teeth set up ready for try-in. Note the clearance between the upper and lower anterior teeth.

Fig. 15—Making cuts necessary to remove a single tooth from the plaster cast with a fine jeweler's saw. The saw is controlled more easily than a knife and there is no danger in using it or destroying the contours of the adjacent teeth. After the tooth is cut away a small sharp knife is used to smooth the cast. I prefer to mark the model with pencil to act as a guide in making the cut. The distance from the gingival margin to the mark is 4 mm.

Fig. 16—The cast after the first tooth has been cut away with the saw and then trimmed with a small knife. On the labial surface the cut is carried 4 mm. above the gingival margin; on the palatal side, only slightly below the gingival border.

Fig. 17—A cast cut through in the incisor region to show the small amount of trimming of the cast necessary to place a central incisor.

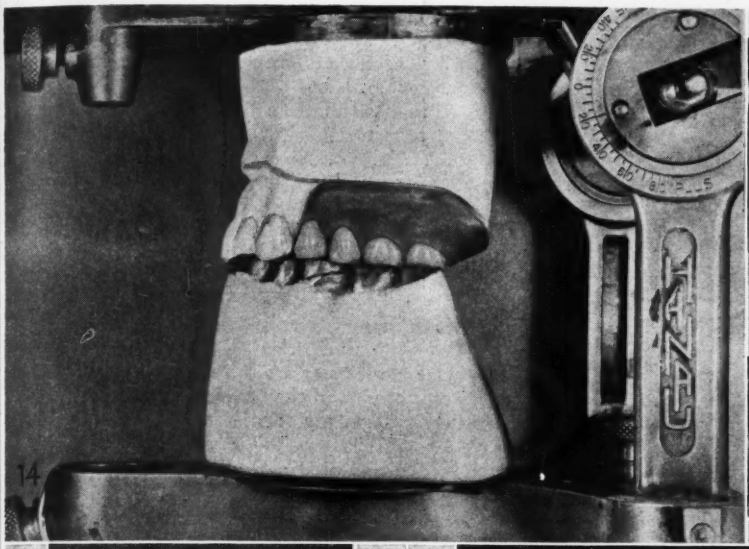
Fig. 18—A central incisor waxed to the model shown in Fig. 16, to show how nicely the teeth can be alined.

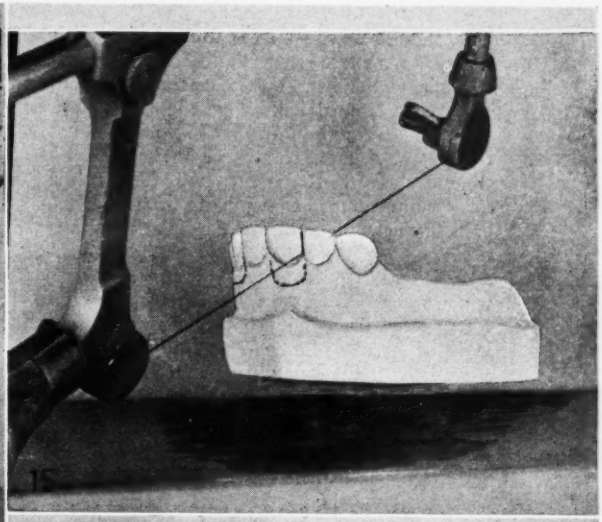
Fig. 19—Cast with the first replacement tooth fitted and waxed into place.

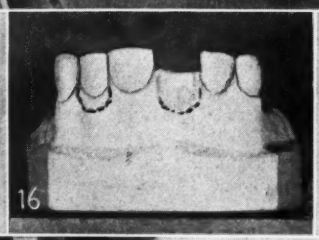
Fig. 20—Cast with two artificial anteriors in place. Proper alinement of the teeth offers no difficulty because the care used in cutting the teeth from the cast has left the neighboring plaster teeth intact and with their proper contours.

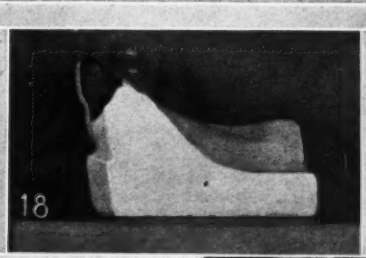
Fig. 21—All the artificial teeth set in place and waxed. In this case the teeth are to be stained and glazed to imitate the natural teeth more closely, a procedure which adds greatly to the esthetic value of the finished case. (For detail of staining see Dental Digest, November, 1933.) This step of staining is, of course, optional with the operator, and if no coloring is to be done the case is now ready for the vulcanizer.

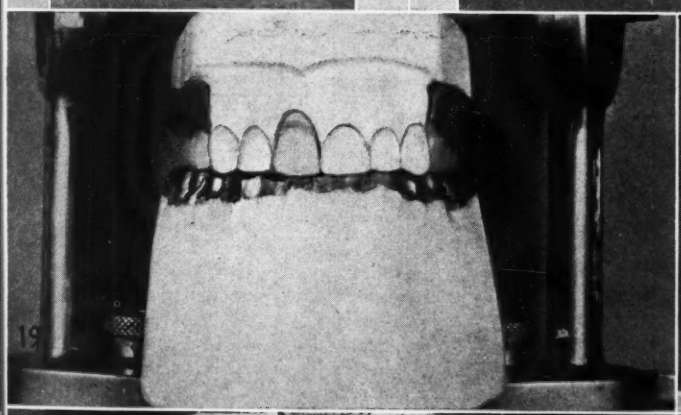
Fig. 22—Completed case ready for insertion. A comparison of this illustration with Fig. 10 will show how faithfully the arrangement of the anterior teeth can be made to follow the arrangement of the natural dentition. Comparison of the two illustrations also shows the amount of bite opening clearly.

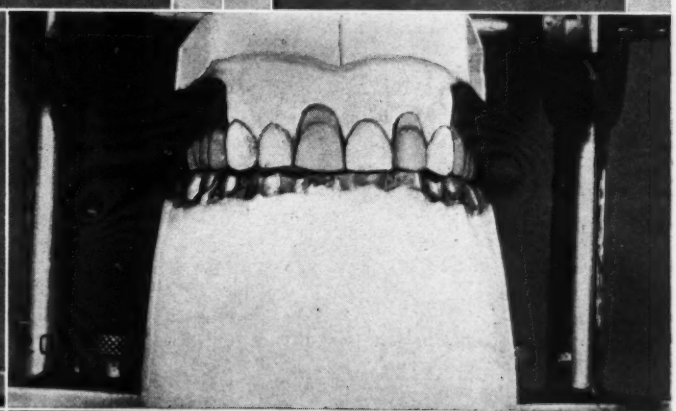


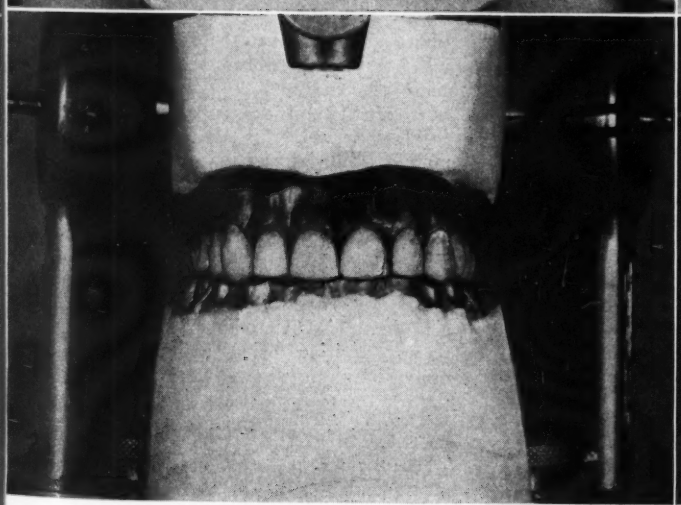


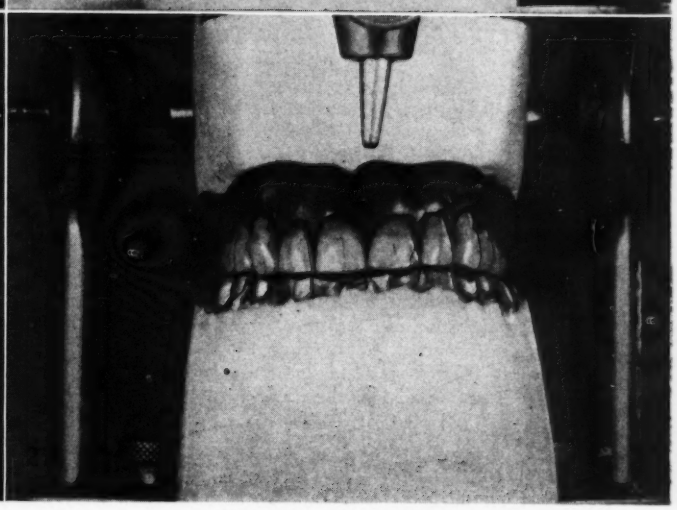












2. A strip of relief chamber metal, long enough to reach from the distal surface of the last remaining tooth on one side, to the distal of the last tooth on the opposite side, and wide enough to extend from the muco-labial fold, to a point 4 mm. below the incisal edges of the teeth, is cut and the corners are rounded to eliminate sharp points which might injure the lips or tissue.

3. This strip is now in a curve which roughly corresponds to the arch form; tried in the mouth to see that it is of correct dimensions; and at the proper point a notch is cut to allow for freedom of the frenum labium.

4. This metal is now covered with heated compound 9 mm. in thickness.

5. Oil or vaseline having previously been applied to the keyed areas of the initial impression, the initial impression is reseated in the mouth and held by the patient with a suitable instrument (Fig. 7).

6. This leaves the operator with both hands free to adapt the section over the labial surface of the teeth and investing tissues; to force the compound tightly against the cut and key-wayed portions of the initial impression; and to manipulate the lip so as to muscle trim this labial section properly.

7. When this is accomplished, the labial section is chilled, preferably with compressed air, and removed; the initial section of the impression is also taken from the mouth.

8. The sections are washed, fitted together, properly boxed, and a *plaster* model poured.

Taking the Bite

It is easy to take the bite for an immediate denture, because the patient still has left enough natural teeth so that there is no difficulty in establishing centric occlusion. A shellac base plate is prepared. This base plate is made to be entirely tissue-borne. The operator should not have it run up onto the teeth at any point. Wax bite rims are attached; carried to the mouth, and after they are accurately seated, the patient is instructed to close in centric occlusion. Whether or not the patient is giving the correct relationship of the mandible to the maxilla may be determined by watching the natural teeth come into contact. At this time a face-bow relation is also taken, and the case is mounted on the articulator (Figs. 9 and 10.)

Setting the Condyle Path

If an adjustable articulator is to be used (and I believe best results are obtained only by use of such a machine), the angle of the condyle path is adjusted to the measurements of the individual case. This adjustment is made in the following manner:

The cases having been mounted in centric occlusion and secured to the articulator, the shellac base plate carrying the wax bite rim is built up by the addition of a layer or two of softened wax and returned to the mouth. The patient is instructed to bite in protrusive relation (an end-to-end bite of the lower against the upper incisor): the wax is chilled, and the bite plate removed. The bite plate is now returned to the articulator; the screws that secure the condyle path adjustment are loosened; the teeth of the lower cast are placed into the indentations in the wax bite; and the condyle guidance paths are gently manipulated until they offer no resistance to a proper seating of the teeth of the lower cast into the upper wax bite rim. When this point is reached the screws locking the condylar mechanism are tightened and the bite rim is removed allowing the articulated models to return to centric relation.

Opening the Bite

In making artificial teeth, it is seldom possible to employ the deep vertical overbite often seen in natural teeth because of the fact that such a tooth arrangement will result in interference of incisors and will not allow freedom in lateral excursion of the mandible. It is, therefore, necessary to open the bite an amount sufficient to allow for clearance, and the necessary amount of opening is ascertained in the following manner:

The incisal guide plane is set at zero (Fig. 11). The articulator is manipulated into a lateral position so that the teeth on one side come into contact (this generally brings about a cuspid to cuspid relationship). The incisal guide pin is dropped to meet the incisal guide plane and locked in position (Fig. 12). The articulator is allowed to return to centric occlusion, and it will be found that now there exists a considerable space between the upper and lower incisor teeth. This is the amount of opening it will be necessary to maintain if the case is to be set up in balanced occlusion (Fig. 13).

Setting Posterior Teeth

The base plate used to register the bite is now stripped of the bite wax, and on it are set up the posterior teeth. In setting up these teeth, I aim to arrange them so as to promote stability in the denture, and to this end, I take care not to set them too far off the crest of the ridge. I am also careful not to develop in the occlusion any interlocking of cusps between the natural lower teeth and the artificial uppers, for any such interference of the cusps hinders the success of the denture. When a proper tooth arrangement has been accomplished and the teeth have been firmly waxed to the base, the case is removed from the cast and tried in the mouth. The appearance and occlusion are checked, such changes as are considered necessary to correct any errors are made, and the case is returned to the cast on the articulator.

Setting Anterior Teeth

In setting up the anterior teeth, it is my belief that they are best set (with few possible exceptions which will be later commented on) in exactly the same position as the natural teeth they are to replace. To achieve this result I use the following technique:

1. The teeth on the plaster cast are cut away, one at a time.

2. With a fine jeweler's saw which is preferred to any other cutting instrument, a cut is made down the mesial and distal margins of the right central incisor, and these two cuts are then joined by cutting across the gingival margin; the incisor is thus removed from the cast without mutilating the adjoining teeth (Fig. 15).

3. Now, with a small sharp knife the *labial* surface of the cast is trimmed to a point 4 mm. above the gingival margin, but the palatal gingival margin is trimmed only *very* slightly (Figs. 16 and 17).

4. A central incisor of proper shade and of a mold as nearly as possible like the natural tooth it is to replace is now ground to an exact reproduction and fitted into the space from which the plaster tooth was cut. Because the contours of the teeth on each side of the space have been carefully preserved, this artificial tooth may be alined exactly in its proper position, and is now secured in place with sticky wax (Figs. 18 and 19).

5. Next, the left lateral incisor is cut from the cast, the same method being used as was employed in cutting away the central incisor; the artificial tooth is fitted into place, its proper position being easily determined by alining it with the remaining plaster teeth on each side, and it is secured in its proper place with sticky wax.

6. The left central incisor is now cut away, the jeweler's saw being used to make the cut, and care being

Fig. 23—Natural teeth where patient has retained six anteriors but wears a partial denture supplying the posterior teeth. The lateral incisors have drifted badly out of line, but centrals and cuspids are in good alinement.
Fig. 24—Artificial teeth in place showing how the centrals and cuspids were set exactly in the position of the natural teeth and how the lateral incisors were put back into proper position.

taken *not* to dislodge the neighboring wax-attached artificial teeth.

7. The cast is knife trimmed, after the saw-cut is made to a point 4 mm. above the labio-gingival line, exactly as were the two previously removed teeth.

8. The artificial tooth is properly placed, now depending for alinement on the artificial central and lateral which are already waxed on the cast (Fig. 20).

9. The remaining artificial teeth are now set one by one in proper position and the waxing up of the case is completed (Fig. 21). In waxing up the case it is advisable to provide a thickness of wax at the posterior border of the palate, which will provide in the finished denture a considerably heavier thickness of base material than is generally accepted as ideal. I do this so that if in my efforts to provide a secure posterior seal I have postdammed the impression too heavily, I am at liberty to trim the base to relieve irritation if any develops. If, however, the denture is worn with comfort and no point of irritation develops, the extra thickness may be trimmed away later. It may be helpful, however, to have a margin of adjustment as is here suggested.

10. The wax on the labial portion of the model is applied in as thin a layer as is considered practicable, so that after the denture is cured it will not be heavy enough to cause an undue fullness of the lip. I do not hesitate to make the labial plate *very* thin in the base material, because the denture is to be rebased at some time within the next six months and when the rebasing is done and the shrinkage of tissue compensated for by addition of base material, the labial flange will, of course, be considerably thickened and in harmony with the other borders of the denture.

A case may be encountered in which some of the anterior natural teeth may have so drifted out of their original position as to be a disfiguring factor which it would be unwise to reproduce in the denture. Fig. 23 shows such a case. Here the lateral incisors, which originally probably slightly lapped over the centrals, have drifted so far anteriorly out of the arch line that it would have been unwise to reproduce this condition in the denture. The central incisors and cuspids, however, have kept their proper places in the arch and, in carrying the case through, care was taken to set the artificial centrals and cuspids in the position occupied by the natural teeth; but the laterals were moved back into what I believe was their original position, slightly lapped over the centrals (Fig. 24). This change was not drastic enough to excite comment, and indeed the patient informed me that he played bridge the afternoon following the insertion of his denture with a group of intimate friends, and none of them was aware of the fact that he was wearing artificial teeth.

In another recently constructed case one central incisor had drifted forward appreciably, and this was, in the set-up, put into a position where, although it still protruded, it did not constitute a gross irregularity.

In finishing the wax-up I believe it wise in these cases to wax in artificial rugae, so that the palate will have a more natural feel than is presented by a smooth-surfaced denture.

11. The case is now carried through the routine of curing and polishing and is ready for insertion.

12. The patient is notified to come to the office, the teeth are extracted, and the remaining bone is smoothed. No great trimming of alveolar bone is attempted for in 90 per cent of cases only such trimming as is essential to smooth the alveolus and to promote rapid healing by rounding sharp edges is necessary or desirable. Trimming of the plaster model, 4 mm. above the gingival border, on the labial, and scarcely at all on the lingual side, is not a procedure drastic enough to require extensive cutting of the alveolar bone in order to place the denture.

If the surgeon who removes the teeth wishes to use sutures there is no contra-indication to their use; however, unless something difficult occurs in the extracting which necessitates severe tissue retraction, it will probably not be necessary to use sutures to stabilize the soft tissue, for the denture itself will act as a splint and hold the tissue edges together. Rapid healing takes place under the denture if the work has been carefully done.

13. Once the denture has been inserted, the patient is dismissed with instructions to leave the denture in place until the next day and to report back within twenty-four hours.

14. When the patient returns next day the mouth is sprayed with an antiseptic mouthwash, and the denture is carefully removed; any spots where there may be irritation are noted, and the denture is trimmed to relieve such areas. A careful operator will have few such sore spots to contend with; in fact, I believe no more than would be encountered in a case constructed when the patient had gone about edentulous for weeks or months waiting for the mouth to "shrink" to a point where a denture could be safely made!

15. The denture is carefully inserted again and the patient dismissed with instructions as to how to care for both the tissue and denture, and to report only when the need arises. In subsequent visits, careful tests are made to correct any errors of occlusion which may have crept in, but at the first two visits unless there is some major discrepancy the occlusion is left untouched. This is done because the fine grinding required to obtain the exact occlusion necessitates frequent removal and insertion of the denture and for the first few days the base is best left in the mouth undisturbed, except for necessary removal to clean or relieve it to afford the injured tissue beneath the denture protection in process of healing.

Comment

As time goes on, of course, tissue change will take place under the denture which will necessitate its being rebased. It will be surprising, however, how long the denture may be

worn before such a measure is necessary, but then again not so surprising when the method we pursued is analyzed. The shrinkage that takes place will be in the anterior part of the mouth, and shrinkage at this point affects the fit of a denture less than change in any other region. As long as the posterior border and lateral flanges of a denture continue in good adaptation, patients seem to tolerate the appliance and use it with a considerable degree of success. I do not rebase for six months, if I can avoid doing so. In the meantime, if the anterior shrinkage creates too great a discrepancy, the space is filled in with modeling compound and worn in that condition until both the patient and operator decide that rebasing is indicated.

As a matter of practical procedure I generally insert these dentures for patients who want to lose as little time as possible from their affairs, on Friday afternoon; see them again for adjustment on Saturday. They are ready to assume their place in the business world on Monday, and have lost only a day from occupation.

Viewed from every angle, the construction of dentures as herein outlined is such an extremely practical procedure that I strongly urge any operator who is seeking to give his patients the greatest possible measure of service to adopt it as part of his routine. It is not a "quick and easy" method, but it requires only that degree of attention to detail which is due any well performed dental operation.

Two East Fifty-Fourth Street.

SUPERNUMERARY TOOTH FOLLICLE OPERATION

Fig. 1—Preoperative appearance.

Fig. 2—Postoperative appearance.

The removal of a supernumerary tooth follicle is frequently more of a surgical obstacle than is an impacted permanent tooth. The accompanying roentgenograms show one such tooth follicle.

The line of incision made in the mucoperiosteum was about two-thirds down the lingual aspect of the first permanent molar, near the floor of the mouth. On exposure of the bone and reflection of the mucoperiosteum, the hard tissue overlying the crown of the supernumerary tooth was removed carefully with a large round surgical bur. A spear-point drill was then introduced mesially to permit the introduction of a lever to lift out the embodied tooth crown.

The difficulty of access and danger to tongue and soft tissues in the floor of the mouth made this case unusually difficult.—M. HILLEL FELDMAN, D.D.S., *New York*.

LETTERS TO THE EDITOR

CALCIUM REQUIREMENT

In the editorial appearing in the September issue of THE DENTAL DIGEST, there is an item which confuses our knowledge about calcium requirement. It says: "One grain of calcium represents the average daily requirement." The rest coincides with our information.

Apperman said: "In the healthy adult the calcium metabolism is in equilibrium; i.e. as much is excreted as is ingested and digested." From this observation it is implied that an individual must be in a semipathologic condition before there is any deviation. He also says in part that the intake of calcium must equal the daily requirement to keep the output balanced; this about 1 Gm. of calcium oxide in the diet of adults, and about 0.13 to 0.17 Gm. for growing children. When less is taken, the equilibrium is disturbed. The output remains the same and there is a negative balance and the body is actually losing calcium.

Besides, we are informed that in pregnancy the ossification of the skeleton takes place principally during the last four months. There is an average requirement of 0.33 Gm. of lime daily for the fetus alone and added to this the need for lime supply of the mother for her own metabolism which is about 1 Gm. of calcium daily; it gives us a total of 1.33 Gm. of calcium supply for the mother and fetus together.

In various types of diseases there is a tendency to need more calcium: In the tetany associated with a low calcium content of the blood, for instance, there seems to be a decided benefit in the administration of soluble calcium salts by mouth or intravenously, and the requirement is as much as 15 grains or 1 Gm. from four to six times daily.

In profuse hemorrhage the need for a large daily requirement of ionized calcium is well known. Blood from which the calcium has been precipitated by oxalate or rendered nonionzable by addition of citrate does not clot. The addition, however, of sufficient calcium salts to such blood brings about its clotting ability.

In diabetes, it is said, there is a loss of calcium from the body and the addition of this substance in the diet plus its activator vitamin D helps somewhat in improvement of the condition.

In obstructive jaundice the coagulation time and bleeding time is prolonged although the blood calcium is not lowered. It may be that the bile constituents unite with calcium salts in such a manner as to reduce the ionization. In this particular condition the administration of calcium salts is said to shorten coagulation time.—T. V. BAGALAWIS, A. B., D.D.S., *San Roque, Cavite, Philippine Islands.*

EDITOR'S NOTE: by this time you will have seen the October issue of THE DENTAL DIGEST in which the correction is made indicating that the daily calcium requirement is one gram rather than one grain.

REMOVAL OF IMPACTED MANDIBULAR THIRD MOLARS: THE GRIFFITH TECHNIQUE

RAYMOND C. BENTZEN, D.D.S.
Sheridan, Wyoming

OF THE many techniques in use for the removal of the impacted mandibular third molar, I prefer the technique perfected by Doctor Charles A. Griffith, a professor of oral surgery at the University of Minnesota. Most methods in use today require the removal of a considerable amount of alveolar process to create a portal for the removal of the entire tooth from its bony crypt. The loss of bone generally delays the healing process by exposing a greater area to infection, and also increases the shock and trauma.

The Griffith technique limits the osteotomy almost entirely to the body of the tooth itself, necessitating the removal of only enough bone to expose the coronal portion of the tooth.

The paramount idea in this technique is to take every tooth out with a minimum of trauma or shock, and this can be done in many instances by cutting the tooth in whatever manner seems necessary. Force and violence should always be avoided. Sectioning the tooth reduces pressure which, in turn, eliminates shock to the nerves and tissues.

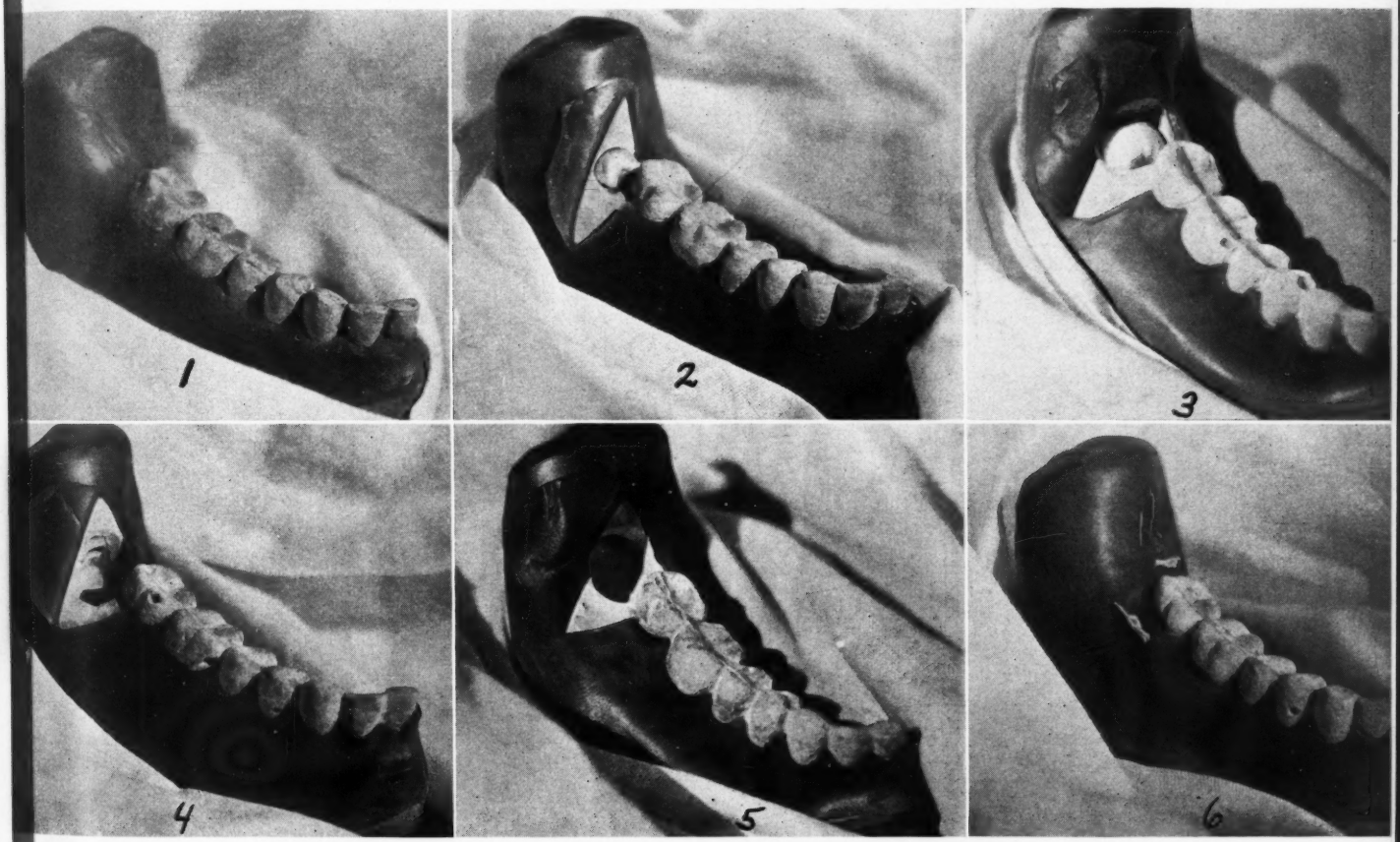


Fig. 1—Preoperative appearance of area with impacted mandibular third molar. Lateral and occlusal roentgenograms are made before operative intervention. The anesthesia of choice is the mandibular and long buccal block. The area is isolated with gauze or cotton rolls and swabbed with antiseptic solution.

Fig. 2—Position and extent of incisions made distally and buccally to the second molar, incising to the bone. With a periosteal elevator, the flap including the periosteum is turned distobuccally.

Fig. 3—With a medium-sized, single-cut fissure bur, tapered to a chisel edge, cut entirely through the tooth at the cervix at right angles to the long axis of the impacted tooth, separating the crown from the roots. This cut makes a space which, in a majority of cases, will permit the extraction of the crown with little manipulation or strain on the process.

Fig. 4—Using the buccal plate as a fulcrum, elevate the crown from the socket. If it is found that the tooth cannot be removed readily without exerting force, cut the crown again from the root toward the occlusal surface, with the same bur, and thereby reduce the size of the crown. Pick out the upper portion and then the lower portion of the crown. Then separate the roots, if necessary, with a bur. Thoroughly irrigate this coronal socket. From this time on, no irrigation is desirable as it has a tendency to shock the deeper tissues and interfere with proper healing afterward.

Fig. 5—Elevate the roots anteriorly and lift them from the socket. Smooth any sharp process with a bone file or rongeur.

Fig. 6—Allow the socket to fill with normal blood clot; turn the flap back, and suture to place. If bleeding is insufficient to fill the socket, insert a soft absorbable dressing.

Sheridan National Building.

INCISAL ANGLE RESTORATIONS

ANDREW R. WHITLEY, D.D.S.
New Orleans

BEFORE my adoption of the method described here, an incisal angle restoration showed too much gold and the esthetic value and translucency were lost.

Types of Incisal Angle Restorations

1. Gold foil is a durable type of restorative material; it is esthetically desirable, but it requires unusual skill and technical proficiency. The operation is often too trying for the patient.

2. The porcelain inlay is esthetically perfect, but it is not strong; the color is difficult to match unless the operator has exceptional skill. If the operator does not have expensive equipment, the porcelain inlay must usually be made in a laboratory outside the office.

3. Plastic porcelain or silicate cement is less durable than the porcelain inlay; it is not practical without protection, but the shading is better.

4. Cast gold inlays are of three types:

(a) The plain gold inlay, with the dove tail or the lingual. This is objectionable for the same reasons as the gold foil. Owing to the lingual dove tail, the plain gold inlay requires much more destruction of the sound tooth structure than the gold foil does.

(b) The window type has poor translucency; a large amount of gold shows and the same amount of sound tooth structure is lost as in the plain gold inlay. This is, however, better than an all-gold inlay.

(c) In the cup-shaped type the same amount of tooth structure is lost as in the plain gold inlay and the window type. The cup is substituted for the window. This type has no translucency and a greater amount of gold shows; nevertheless, it is better than the all-gold inlay.

5. The restoration I am presenting has all the good qualities that are possible with our present restorative ability; it combines simplicity, translucency, efficiency, durability, and is ideal esthetically.

Technique

1. Prepare the cavity the same as for the reception of a plastic porcelain filling.

2. Fill the prepared cavity with copper cement, carefully bringing out the angle that was lost (Fig. 2).

A roentgenogram may then be taken to determine the location of the pulp chamber; but that is not altogether necessary.

A wedge is placed between the tooth and the adjacent tooth to get a good separation. At the next sitting a

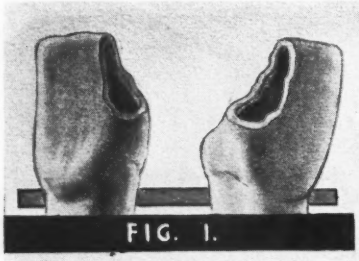
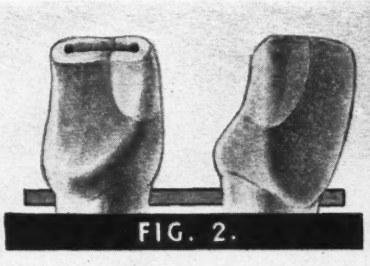


FIG. 1.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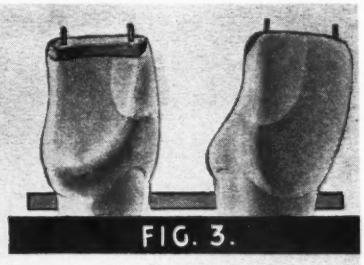
FIG. 3.

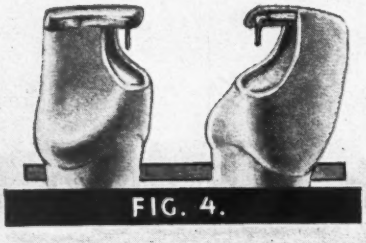
FIG. 4.

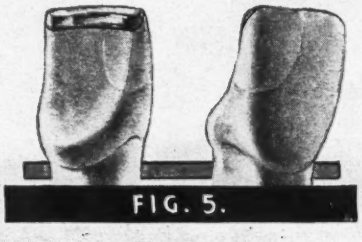
FIG. 5.

Fig. 1—Missing incisal angle.

Fig. 2—Prepared cavity filled with copper cement with hole in dentine and copper cement grooved between labial and lingual plates.

Fig. 3—Clasp wire posts in position through inlay wax in parallel holes in preparation.

Fig. 4—Casting cemented in restoration after removal of copper cement.

Fig. 5—Finished restoration with plastic porcelain where copper cement was first placed.

new cement filling is placed in the cavity, if the tooth is not in its full anatomic form. The operator should be sure that all the anatomic contours are present.

3. The incisal edge is cut from lingual to labial to about a forty-five degree angle, a number 53 wheel small mounted point being used. Care should be taken not to shorten the labial plate. With a number 1 round bur, drill a hole into the copper cement about 4 or 5 mm. long and parallel to the long axis of the tooth, and about 1.5 to 2 mm. from the respective surface of the tooth. This is repeated into the dentine at the other angle. Then with a number 18 knife-edge, small mounted point, a small groove is cut between the labial and lingual plates of the tooth (Fig. 2).

4. The preparation thus being completed, the operator is ready to make a wax pattern. Before wax is placed on the preparation, two small pieces of 21 gauge, clasp wire, white gold, about 7 mm. long, are placed into holes drilled in the preparation. These holes should be parallel. These posts should be a few millimeters longer than the holes in the teeth to allow room for holding them when they are plunged into the wax on the preparation. The inlay wax is placed on the preparation as it is done on any other inlay preparation. The pieces of wire are then heated and plunged into the holes (Fig. 3).

5. The wax is removed and then cast, white hard gold being used.

6. The inlay is cemented into the tooth in the usual manner. Twenty-four hours should elapse before polishing is done.

7. The patient is instructed to return. After the inlay has been polished the copper cement is removed and the porcelain is placed in the angle of the restoration, which was once copper cement (Fig. 4).

8. The finishing procedure is the same as in any ordinary porcelain restoration.

In some cases, crown forms may be used but I prefer the large celluloid strips for holding the porcelain in place. If a rubber dam can be used, it should be placed on the tooth before the copper cement is removed.

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LETTERS TO THE EDITOR

Etiology of Dental and Facial Deformities

About ten years ago a distinguished educator made the comment that it usually takes about forty years for a new truth to become part of professional and lay practice. Things are probably moving more rapidly today and he doubtless would shorten the period.

In the October, 1934, issue of THE DENTAL DIGEST, I note with interest the chart entitled: THE EDUCATION OF THE DENTAL PATIENT: How Irregularities of the Teeth Affect the Face. Class II and III Malocclusion (Angle classification) are splendidly illustrated with clear and concise descriptive texts. Under the caption CAUSES, explanations are given for the Class II as follows: "Thumb and finger sucking, mouth breathing, enlarged adenoids and tonsils, lip biting, face propping, use of pacifiers, muscular inactivity." And the causes of Class III: "Imitation, pillowing habits in sleeping positions, abnormal tongue and swallowing habits, thrusting lower jaw forward in cases of enlarged tonsils."

This presentation of the etiologic factors must be considered as orthodox in the light of many papers by orthodontists dealing with that subject. This may be a good illustration of the difficulty that our profession has had in interpreting the etiologic factors by studying affected persons, or persons residing in groups in which certain of its members are affected.

Personally I believe there is sufficient evidence available to justify and require a new conception of the etiologic factors involved in dental and facial deformities. I have already presented data with regard to facial deformities in the Gallic people in the Isle of Harris. No deformities occurred among persons on an adequate native diet whereas they did occur in the Isle of Bardsey where the nutrition was that of modern civilization. I have shown two groups of children: one, in the Isle of Harris who have normal facial development; and the other, of a group of children in the Isle of Bardsey, all of whom are mouth breathers with a distinct disturbance of facial development. These pictures were presented in the August, 1933, number of THE DENTAL DIGEST.

In THE DIGEST, the 1934 series of my articles, I presented similar data for the Eskimos and Indians. Not a single case of irregularity of the teeth was found among those on the adequate native diet, but many were found in the groups using modernized foods. Likewise, in my field work this summer, in which I studied many hundreds of relatively primitive Melanesians and Polynesians, not a single case of Class II and III malocclusion was found among those living on their adequate native foods. Many cases, however, were found among the groups using modernized foods. Over and over I saw children sucking their fingers or thumbs in the primitive groups yet not one child was found with facial deformity.

I am not raising the question at this time as to how far orthodontic treatment can correct facial disfiguration, such as you have illustrated. I know it is your wish and intention that the public shall be correctly informed. I am wondering how long it will take for the public to get this new light on the cause of facial deformity and use this means for its prevention. I am very sure that they will watch the pages of THE DENTAL DIGEST for new light as it becomes available.—WESTON A. PRICE, D.D.S., M.S., *Cleveland, Ohio.*

Root Therapy

Since root therapy with follow-up of apicoectomy is an every day problem in dentistry, I take it that articles on this subject, pointing toward simplification and perfection of technique are of special interest to your readers. This communication is occasioned by Doctor Mittleman's letter in your issue of December, 1934, anent Doctor Hillel Feldman's article in the August, 1934, issue of THE DENTAL DIGEST.

While I agree on the soundness of presurgical root filling under any and all conditions, I cannot concur in the wisdom of the vulnerable mechanics of root-end plugging as described by Doctor Mittleman when a simpler and safer procedure is available.

Repeatedly, since 1921, I have given a technique for root-end sealing which is applicable in all cases of seepage, especially for roots with nonfused ends. A chlorogutta-percha plug of approximate size is driven into the apex until all seepage is blocked. The excess of gutta-percha, if any is present, is removable by reaming away before final root treatment (if in the canal); or the excess is removable together with the root apex (if periapical) at operation. In the latter instance excess gutta-percha serves also as a landmark.—BERTRAM B. MACHAT, D.D.S., *Brooklyn, New York.*

First Mandibular Injection

If you were to ask one hundred dentists who it was that made the first mandibular injection, perhaps one or two might know the answer. This injection was first made by William Stewart Halsted in New York city in the year 1884. He was later professor of surgery at Johns Hopkins Hospital in Baltimore. He was the first to use cocaine for local anesthesia, and also the first to wear rubber gloves while operating.

These facts I believe to be of sufficient importance to take a place in the very interesting OUTLINE OF DENTAL HISTORY which appeared in the December, 1934, issue of THE DENTAL DIGEST.—JOHN JACOB POSNER, D.D.S., *New York.*

ABOUT OUR CONTRIBUTORS

ELLIS GEORGE BOVIK was graduated from Northwestern University Dental School with the degree of D.D.S. in 1927 and received the M.S.D. in 1932. Doctor Bovik is a member of the A.D.A., Illinois State Dental Society, and the Chicago Dental Society. He is assistant professor of oral surgery at Northwestern University Dental School and has been teaching oral surgery since 1927. Doctor Bovik practices general dentistry.

WILLIAM DUNN, D.D.S. (Philadelphia Dental College, 1887 and Surgeon-Dentist, Royal University of Bologna, 1885) has practiced dentistry in Florence, Italy, for fifty years; now retired. For years an active member of the American Dental Society of Europe, he has contributed papers on high-frequency currents and ultraviolet rays, giving demonstrations. A close friend of the late Professor Luigi Arnone of the Royal University of Florence, inventor of the Lampada Italiana for Ultra-Violet Rays, Doctor Dunn has been able to follow this eminent man's interesting studies and experiments on radio-active phenomena.

MELVIN E. PAGE received his D.D.S. in 1919 from the University of Michigan College of Dentistry. Doctor Page has previously contributed to the dental literature. He is a member of the A.D.A. and National Society of Denture Prosthesis and has a general practice emphasizing prosthodontia. Doctor Page has been engaged in research work on calcium-phosphorous metabolism at the Mercy and Hackley hospitals, Muskegon.

ABRAHAM B. ADELSON, D.D.S. (Northwestern University, 1911) contributed an article, A METHOD FOR THE CONSTRUCTION OF LARGE INLAYS IN PULPLESS TEETH, in the October, 1932, issue of THE DENTAL DIGEST.

IRVING R. HARDY, D.M.D. (Tufts College Dental School, 1917) appeared in these pages in November, 1933. The title of the article was MINERAL STAINS IN THE CONSTRUCTION OF DENTURES.

M. HILLEL FELDMAN, D.D.S. is familiar to readers of this magazine as a frequent contributor of short articles on oral surgery.

RAYMOND C. BENTZEN, D.D.S. received his degree from the University of Minnesota in 1929. Doctor Bentzen has a general practice. He is a member of the A.D.A. and Wyoming State Dental Association. Doctor Bentzen reported a case illustrating the importance of roentgenographic examination in the March, 1932, issue of THE DENTAL DIGEST.

ANDREW R. WHITLEY, D.D.S. (Loyola University School of Dentistry, New Orleans, 1927). Doctor Whitley is a member of the A.D.A., First and Second District Dental Society, Louisiana State Dental Society, and secretary of the Loyola Dental Alumni Association.